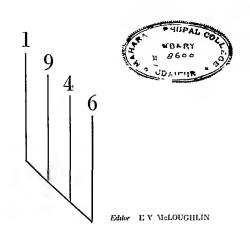
THE BOOK OF KNOWLEDGE

ANNUAL



THE GROLIER SOCIETY NEW YORK · TORONTO

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BOOK OF KNOWLEDGE
The Children & Encyclopedia

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THE BOOK OF KNOWLEDGE ANNUAL 1946 is a survey of the most interesting and important events of the year that has passed perhaps the sort of survey you might have made if you could have set on the moon and watched the earth through a big telescore If you had done that you would surely have noted that one major subject occupied men a attention more even than war though it was made to serve the war The subject of course was Science Chief actors in the most spectac plar drams of the year were neutrons pro-

tons and electrons particles that make up atoms the bits of matter Every civilized person on earth was shocked by the stom omb anto realization that a new era had dawned You have seen history a time clock click forward The keynote of this ANNUAL therefore is Science There are chapters on basic science -articles that explain etoms and molecules atomic energy and radiation. There are chanters on astronomy, and on new discoveries in chemistry and biology The science books of the year are reviewed and scientific progress in aveation and other industries is reported

There are chapters which set forth the scien tife bous of our economic life Do not be afraid of the word science It comes from the Latin scire to know science in its broadest meaning is nothing more nor less than knowledge A wase man once said that the great circle

of knowledge is most useful not at its core but at its rum where it touches other knowl edge So it is with modern science If you understand any are of it you soon find that it sheds I ght upon another arc in the circle
It is the editors hope that The Book or
NOWLEDGE ANNUAL 1946 will hight for

a boy and girl many an arc in the wide sincle of Science

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AFRICA

...a continental

question mark ...

Rν

Roy Winthrop Hatch

IN the vast cont nent of Africa there are many Africas with such important differences of peoples and governments that we must speak of them separately

There is North Africa and French West Africa and Expt and the Sudan There is Eth opa and French Equatorial Africa and Box as East, Advices There is the Adjace Congo and Liberia and British West Africa There is Portuguese West Africa (Angola) and the Umon of South Africa and each one of these Africas has its problems

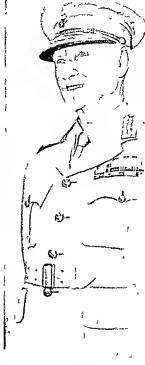
If your father and mother were asked to choose one word to descre be the Africa they read about when they were in school they would probably use the adjective of the great explorer Henry JI Stanley who spoke of darkest Africa Did you ever stop to wonder why Africa was given such a name? Africa was given such a name? Africa was given such a name? It does not be the africa Top Lightly there as the such as the suc

interior of the continent were absolutely un

kno vn to us

Today new light has been thrown on the dark continent. And many boys in soil of ers uniforms have helped to bring this new light. They have written home about the places and the people they have seen. They have told of strange native customs of new fruits and vegetables they had never eaten before of the wild an mails of the trope jungles the weird beauty of a great desert in the monalight the sweep of broad rivers and the mysterious Mountains of the Moon.

In these letters and in the newspapers moving p ctures and over the rad o we have some with the troops from Casablanca to Cairo to Cape Town But all these bits of cription that we have pieced together may have given us a picture of Africa rather I ke



e given us a picture of Africa rather I ke Royal Canad an A For photo graw puzzle with important parts missing for Christian Smoth prime minister of South Atrica.

of Africans Belgium Spain and Portugalook upon their colonies as permanent possessions These policies conflict with each other and create many difficulties not only be tween the European powers involved but more directly with the natives

Of the two independent countries in Alrica one is a republic and the other is a lingdom Thanks to air travel the Negrorepublic of Liberta no longer seems very faraway. Fisherman is Lake in Libera is a base of the Pan American Airways. The bulge of Erazil is nearer to Fisherman is Lake than it is to Dakar on the African bulge One of the important developments in Libera in recent years has been the production of rubber which you may read about in The Story of Rubber in this Airway.

The only other independent country in Africa is Ethiopia the valiant kingdom of Haile Selassie In 1935 (Wissolim's sold ers invaded Ethiop a But with England's a d Ethiopia drove out the Hailans in World War II and Haile Selassie again sits upon the independent throne of his fathers

In other divisions of Africa there are grave problems of race and color These problems are acute in the Union of South Africa. The natives of South Africa and Africa, and the second of the population but they possess only 8 per cent of the population but they possess only 8 per cent of the land However some of the white leaders of South Africa such as the venerable Jan Smuts are mindful of the needs of the natives. In northers Africa where the Mohammedian edgion pre Africa where the Mohammedian edgion pre for Mohammedians do not believe in making color or race distinctions.

AFRICAN BOYS AND CIRLS IN SCHOOL ARE BRIGHT AND QUICK TO LEARN

There is plenty of evidence that African children respond as well to any type of schooling as European children do Mission aries and travelers in Africa have stated that the cultural possibilities of the African natives are undemable. They have found the African able to profit from a high degree of

training and education
The story of the treatment of African

natives by the ruling whites is not a pleasant one No issue calls for more immediate remedy than does the ill treatment of the natives by some of the white overfords or bosses 'altre Africans form a large supply of

cheap labor for many African industries such as mining—in South Africa—and the rul ber industry of the Congo and the equa



fent Pes and Inf na on Sevce

The Sal as a Moseco decreme a native solution to rial belt Some of the Africas have mosed taxes known as the Head and Huit taxes. The workers have to pay these taxes out of their small wages and this keeps their standard of I hung very low Unfortunately Europeans have brought tuberculous; and other diseases to Africa. These have taken a tetrible toll among the natives.

However there are leaders, both black and white who see clearly that many of these old problems must find a remedy in the near future. Many of these leaders are turning to the schools for help. Schools are now being formed to teach and train young Africans so that they may be better and more

efficient citizens

One of the leaders in this hope for a new Africa is Dr. Ako Adier When he was a box Ako Adjer was a member of the Ga tribe of the Gold Coast. He came to the United States as a young man and studied law and journalism at Columbia University Now Dr Adjer is a professor at Fisk a Negro university in Nashville Tennessee He speaks therefore as one who can see both sides of Africa's problems Although Dr Adjer believes that his native land can have a bright future he knows that the Africans themselves must be taught to ach eve it. In his own words. None of the plans and pol cres we now formulate for post war Af rica will ever succeed until the Africans themselves are trained to assume responsi bility for their own destiny

AGRICHITURE and a

HEALTHY WORLD

By Robert F and Laura T Griggs

OR the first time in h story it beg is to seem possible that all the peoples of the world will be able to get the right quantity of the right food to make them well and

strong and happy

Down through the ages great masses of people n one part of the world or another have known the dreadful mean ng of starva tion The cry of not enough food not enough food has been and at Il is uttered by vast populations. The lack of food kills many and it leaves many more in a weak ened cond tion that greatly cuts down the number of years they can expect to live Not only is the amount of food important

but likewise the kind of food. The emphasis on nutritional content-that is the actual chem cal value of the food to man's organic system—can not be made strong enough The doors of this subject have just been opened in the last few years We know much more than we used to know about what foods keep people healthy Agriculture by using this knowledge to produce the correct foods will help the world's bill ons

In May of 1943 representatives of forty four nations met at Hot Springs Virgin a for a Conference on Food and Agriculture Never before in h story had so many nations met to cons der their peoples welfare Their report carried a clear picture of the world's need for food The better fed nations were listed as Australia Belgium Britain Can ada Germany Holland the United States (except for the southeastern states) the Scand navian countries and New Zealand

Of the less well fed peoples of the earth the Hot Springs report drew a picture of present needs and destrable changes. China s delegate reported It is a conservative estienough to eat Stark famine is not uncommon and in North China is a regular or

currence In Ind a co per cent of the farm families have poor health due largely to malnutri tion (lack of nourishment) and most of the people of India are farmers In these two great countries of three fourths of a billion mhabitants the average length of life is only about thirty six years. In the best nourished countries such as Denmark and New Yea land the average person lives nearly twice as long to sixty seven years

In the Philippines under the United States Government 15,000 die every year from the disease of beriberi a disease of the foot nerves even though we know the cure The natives eat almost no vegetables and fru ts Of the r babies only half as many live

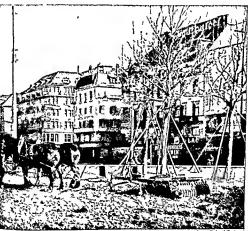


as in America. In the countries bordering the Mediterranean severe poverty and milnutrition are the rule.

Careful studies in Britain and the United States have proved that where there is pow erty the people are undernourished. When the incomes of the people go up as they have done during the war, the poor buy more protective foods, such as milk, meat, etc. One of the chief causes of food shortages during among the people. More people could affort to buy better food yet the supply did not rise in pace with the demand.

As an effort toward solving the problems of agriculture and food supply in the world, the United Nations Food and Agriculture Organization held its first meeting at Quebec in October Thirty seven countries were represented Here a groundwork was had for cooperation among all peoples Further meet ings will take plrice as planning leads to act toon The aims of the organization are raising world nuttion levels and standards of living improving methods of farming to make the most of land and labor bettering conditions of farm populations expanding world trade.

Some people like Thomas Malthus of the last century—a noted political economist and teacher—beliese that the populations of the world must necessarily grow faster than food to feed them and that consequently starvation must always be present But Malthus gloomy prediction of a starving world did not foresee the possibilities of science





Endcap Fayne a champlan milk producat paints the way laward a pleatiful we ld supply of mile

He could not imagine the results research

would bring.

He did not deetin that a few Instantis acould extently breed corn year after year until they had old one in Institute (cross until the year). The properties of the condition of the properties of t

Breeding of improved strains of animals which is much more difficult than plant breeding naturally ligs behind. The men of old time however would not have believed possible the improvement which has occurred in the dury cow. The pride of colmail Maryland was Old Five Pints in mind for her duly milk production. Now Mikapal Tayne gives her own vight in milk every two weeks—High fice oaards a day.

Behind the scenes of increased milk and lat production like this lie many stories such as the one starring the agricultural scientists who work at the Missouri Agricultural Ex periment Station. The men toiling here no ticed that in feeding a cow portions of an fedine compound called thyroxine there was an increase in the milk and fat supplied by the animal Goats were likewise affected However, the price of thyroxine was high Research workers at the station went to work on the problem and found the solution An artificial method of obtaining the substance was developed in which the proteins of skim milk are skillfully combined with iodine. This process brought the price down t a point where more dairymen could use the material and thereby increase the prodictivity of their bends

the common apple too received a production just from the hand of agricultural science Growers of the eastern United States were hoing namy dollars a year due to the last that apples were impiping from the tree before they were type enough to be sent to market. These apples were known as 'bad drogists'.

The Beltsuile Maryind, borticultural station was interested in growth producing substituces (hormones) and their effects on [runs its workers had done much about howel his properties of the produced that some bormone, types stopped plant leaves from lalling off easily these they tired on fruit with amazing results. Apple varieties which had been known as bail droppers renumed on the irres long aiten normal time Ordard velds mere-sed. And so by using a simple bagger hardest.

SCIRRCE NOW ENGWS WHICH FOODS ARE RERDED FOR GOOD HEALTH

Until recently it was supposed that man needed only a few nutrenia, fast carboly drates (brend, sugar etc.) proteins (in meats fish eggs etc.) and some minerals Today we know that we require many nutrent substances although some in only ting quantities. Because a small group of scient tists his worked long years in paintaking research, we now know what foods people must have to be healthy and to resist disease.

What are the conditions which have led to the 'hewer nutrition? Widespread dis eases which no one knew how to conquer were cathing for cures. Take pellagra, for example, in the southern United 'States Wentally depressed people with horrible sores over their bodies began to appear in large numbers throughout the new mill stowns where industries had moved from the North to get cheap about For mann's will new Manny wondered if the monotonous diet largely corn point, could be connected with it. Today its cure seems like a miracle One must see at it to believe it.

One must see it to believe it
A raving manuae suffering from pellagra
is brought to the hospital. It takes three men
to hold him in the ambulance. Besides his
mental dhiess he has loathsome sores over
his body. He is in such a state that his relatives can hope only that he will not linger.

long A few milligrams (thousandths of a gram) of a simple chemical compound—mic other acid or macin for short—are impected into his blood stream. In seventy two hours he is himself again, and his sores have begun to heal.

A CURE FOR A DOGS DISEASE PROVIDES THE CLUE TO THE CURE OF PELLAGRA

How has this magic cure been brought about when only a few years ago physicians were as helpless to cure pellagra as they now are with cancer? The discovery of a cure for the disease known as black toner e in does by C. A. Elveihem at the University of Wis consin led the way It was proved that this disease is related to pellagra in man The latter was found to be caused by the lack of a tiny quantity of macin which would have been supplied if milk lean meat turnip greens or collards had been a part of the regular diet of these people Entirely differ ent then are these deficiency diseases from typhoid fever tuberculosis or malaria which are caused by living parasites that attack their victims

Deficiency diseases have long plagued mankind all over the world. One of the chief diffculties Christopher Columbus had to fight on long voyages was scurvy the most prevalent disease in Europe at that time Just a little later Vasco da Gama sading around the Cape of Good Hope lost nearly two thirds of his crew by this disease Scur vy was found especially among sailors sol diers on campaigns and people in besieged cities People suffering from scurvy develop spongy gums their teeth become loose fall out The walls of their blood vessels break resulting in bleeding within the r bodies. In the Crimean War more fives were fost from scurvy than in all the bloody battles

Early observers noticed that folks who had plenty of fresh vegetables and citrus fruits did not have scurvy. The early New England settlers strongeled with that observed and learned to prevent it by eating fruits and sprouted grain. One of the hencits some early colonists took back to England was the white polato. When it was grown throughout Europe scurvy almost disappeared.

In spite of the clue that this disease was connected with what people are it was 300 years before the exact cause was understood C G King of the University of Pittsburgh discovered the scurvy fighting substance in 1032 and succeeded in making it It is known as vitation C.

The nutritionists are discovering more



Felica apples The nee of a new sp ey would have kept these apples on the tree until harvest time



Apples ready for picking Thooks to a spray the fruit did not fall belors givening

ibout this useful sitimin all the time. When taken in four to eight times the amount needed to present servey it is claimed to produce much better general health, and to help avoid such diseases as the common cold menumonia and even tuberculosis.

As serious and widespread in Oriental countries as scores was in Europe beriben took a heavy roll of life in the I ast About 18So a high medical officer of the Japanese navy noticed that lititish sailors in the Pa cutic did not suffer from this disease which kept almost one ball of his men on the sick list every year. He decided that the trouble must be with the diet of the Japanese Most Oriental people live largely on rice and white polished rice by choice This officer sent two vessels on long voyages. Of the 226 men in the first 160 had beriber. The second ship with a similar crew he sent over the same mute but he changed their ration He cut ill will the rice increased the bailes and added ment vegitables and condensed milk Only 14 men had beribers and each of them had refused to eat all of the new food Because of this experiment, the entire Japanese navy diet was changed and beribers practically disar ocured amone them

In spite in this successful experiment there were named and of left that the improvement might be due to better sanctition. A Dutch physician himself working in the Fast In dies noticed that chickens eating polished rice bytd an illness similar to berther! The made careful tests and floated that be could produce berubert in poultry, simply by feed ing polished rice.

PICE HAS A PROWN OUTER COATING

In the Philippines physicians began to experiment along similar lines It was found that bether could be introduced by feeding hospital patients polished rice, or cure it by feeding rice with the brown outer coating left on This was indeed a loward star.

However, it took twenty five long tireless jeats before Dr. R. R. Wilams sweezeded in separating the pure substance that prevented beriber! in working out its complicated chemical formula and in learning to make it synthetically (out of easing materials). This witamin is called thamin It occurs in small quantities in many common loods, though richest in meats especially pork, whole grains and beans

It was Dr Russell W Wilder and others of the Mayo Clinic who proved by experiment that without thiamin in their diet hu

man beings lose their will to work become into-operative Iritable, quarrelowne. When thannin is restored to their food they become well and normal within a short time It has been suggested that thannin was the best than the second of the standard of the

A PAMOUS BREAKFAST THAT WADE CHILDREN GROW TALLER

In the exerch for a better understanding of nutrition many special experiments in feeding hive been carried out. In Norway, where some school children were given an extra meal the average height of fourteen pear-olds was increased by four noties. The Ool or text fast as this experimental meal was called convicted of milk, orange, whole where the other control of the orange of t

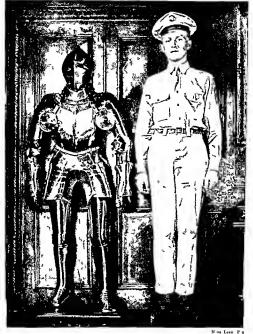
been uniconcept until the lates of the control the base of the young mee has been steady) in creasing. Whitary records prove that American soldiers in Mortil War II surveyed a full inch and a half (wifer than their lathers in the first World War IP. American soldier of today could not possibly have gotten into the amout of the sixteenth-century warmors fee halps they are not such encounting the the strong and the sixteenth-century warmors fee halps they are not such encounting the stories.

MODERS ARMIUS UNDERSTAND THE VALUE OF A GOOD DIET

Modern armes have spared nothing in providing the best possible intrition for their men. The German Government saw to it that the working people as well as the soldiers were well led. It subsidized milk vegetables and postators so that the poor could afford a good diret. That is the Government paid part of the cost of production to the larmer so that the price remained within the reich ol all.

British nutritionists were quick to see the need of providing a healthy diet for all their people during the war. They advised their government likewise to subsidize the protect twe foods, holding them at a price the poor est could alford. In spite of the blitz and the loss of ships by submarines, they maintained

WARRIORS ARE GROWING TALLER



Roberts at add were perity short follows, forged by modern standards. This cult of encor was talland at all a keight of the addressic neutry. The solid structing above its an away are moretan recruit 5 feet As in be tall. Schemics tall on that improved of our harm beings to bring about a steadily increas ng average beight, In a little over alltry years in the Scheminade screening average again at the notion.



Like countless other children this youngster to the Ph lippines needs her Red Cross gift of feed

the health of their people. There were no epi demics such as that of influenza during World War I Wost remarkable of all the people on the average were better fed than in peacetime Without such provision it is doubtful that Britain could have held out Commenting on Britain's war food policy Sir John Boyd Orr newly chosen director general of the United Nations Food and Agriculture Organization said 'We have examined the lood position on the assump tion that the object of the war policy is to provide the whole population with a diet adequate for health. It is to be regretted that we dd not have such a policy in pre war days when food was actually or potentially so abundant that measures were taken to restrict the national supply

We now know that the lack of proper food may be largely responsible for epidem ics It has been proved by experiment that protection to the body from infectious dis eases is chiefly provided by plenty of protein in the diet Proteins as we have seen are supplied especially by meat fish eggs cheese and beans though small amounts are con tained in most foods. The British by provid ing their people with a bread which retained most of the original nutrients of wheat, by giving priority to milk cons over beef cattle and by greatly increased planting of nota toes saved their peoples health in spite of the war A larger proportion of the habies lived than ever before. In Scotland, the reduction in infant deaths was 20 per cent

The first act of the United States War Food Administration was to require the en rschment of all bread according to the for mula recommended by the Food and Nutri tion Board Nearly half of the states to date have passed laws making the enrichment of bread permanent and requiring also the enrichment of flour Several of the southern states have present similar laws requiring the correlation of corn meal If enrichment were universal pellagra would be wiped out en terely

As a result of advances in the arts of agri culture the Umted States broke all records for food production in each of the years be ginning with 1917 and continuing through the war Each year a bigger crop was har vested than ever before and this record breaking was an important element in the victory over Germany and Japan

These feats were accomplished in epite of serious shortages of man power and ma chinery The meaning for the future is plain When the boys are all home from the serv ice and when new and improved machiners is readily available again. American food production will go on to dizzy heights and new records

MARY FACTORS WILL HELP TO GIVE US BETTER AND MORE PLENTIFUL FOOD

We are promised by the experts that before 1950 the United States and Canada will be faced with the problem of gigantie food surpluses Progress in science will make sure that this food is in the truest sense better than ever before Agriculture will then face a battle royal in marketing these products The average buyer in Chicago on Thurs

day will have his choice of oranges picked on Wednesday in California or Florida Plant ripened Texas strawberries will be hardly more than a day from any place in the Unit ed States as air transport whittles the farmer to-consumer time

A fast growing industrial child is the quick freezing operation. It opens vast fields to agriculture. As the change-over from war time to peacetime manufacturing permits industry may approach its goal of placing a quick freeze unit in every home that now has a refrigerator Cold storage locker operators and frozen food stores plan delivery to the home on a weekly schedule. The housewife will be able to plan her meals a week ahead regardless of season or weather Complete pre-cooked pre-cut and pre-packaged meals ~3°E-

further brighten the prospects

Rosy as this picture seems there is a cloud on the horizon Generations hence people will find it hard to believe that some of their ancestors of the 1930s and the 1940s suf fered dire distress from lack of food while others could not sell the food they raised Right now in spite of surpluses that face agriculture in the United States and Canada there is still the threat of famine in other portions of the earth

The Hot Springs Conference of the United Nations estimated that almost truce as much food as the world produces at present is needed to feed the world properly. This is a tremendous order Can it be done?

The conference report suggests how it can he done Most of the methods it lists are not new Rather they recommend going further on what has already proved successful (1) more of modern agricultural mach nery with credit made more easily available so that farmers can buy what they need (2) more lands to be brought under cultivation (3) better breeds of cattle (4) better seed for crops (5) more and better soil conservation to prevent the wasting away of our lands (6) larger livestock production (7) larger production near population centers of per ishable protective crops such as vegetables fruits milk eggs and meat

WORKING TOGETHER NATIONS CAN ASSURE A FAIR RETURN FOR THE PARMER

This world wide program the conference points out can succeed only if nations work together the more fortunate countries mak ing loans and giving technical assistance to those less developed. Only by international trade on a greater scale than ever before with a fair return for the farmer can the plan succeed Success in such an undertaking would solve the problem of the farmer and as the farmer prospers so prospers the whole nation

One part of the plan is comparatively new that of shifting farming more toward fixel production A gixel example would be growing less cotton in the undernourished southeastern United States and more protective foods

Denmark successfully made such a change ears ago When Brita'n stopped tuying Danish wheat in order to favor the Canadian farn ers. Denmark was left in real distress With courage and vision the Danes then en tered a help-one another way of life (co-operative system) that saw them raise bogs an I paultry of the highest quality. A little coun-

try without any great natural resources such as forests coal or minerals yet she has solved the problem of living Her people as n whole are now better fed have better med scal care and are better educated than any other country in the world except neighbor ing Scandinavian countries

SHOULD AMERICAN AND CANADIAN FARMERS DEAR TO PRODUCE FOR EXPORTS

American and Canadian farmers today are enjoying a living standard well above that of former years Farm income is higher than ever This is chiefly because agriculture in these countries is producing for export as well as for home consumption. And in the words of Dr G S H Barton deputy min ister of the Canadian Department of Agri af farmers do not continue to plan production for export to give the over seas buyer what he wants then the farm standard of fixing can not help but decline

The solution of agricultures diffculties les in supplying food to all the people who need it But the process is a vast and complicated one The experience of the past shows that the mad rush of nations to become self sufficient and to maintain high tax walls be tween themselves and the rest of the world destroys the r export trade. This must not happen again

If the United Nations set themselves to the great task of finding ways and means to feed all the peoples of the earth the good which can result could not be measured. This alone would go a long way toward abolishing war For just as long as great populations are hungry there can be no stable peace

The practical effect of feeding all peoples would be as much a help to agriculture as to the hungry With a reasonable return to the farmer and with a fair adjustment between industry and agriculture such a program of increased food production would spell pros-

perity for all people

President of the United States Harry S Truman in an address to the United Nations Food and Agriculture Organization meeting at Quebec said that this was an organiza ti n dedicated to achieving two ambitions through common effort and sacrifice- First that people in all parts of the world can and should have plenty of food and of other products of the farm and second that the worll's people who draw wealth from the earth an I see can and should enjoy their fair share of the good things of life

These are high goals the challenge faces world agricul ure an i world government



An ardinary photograph of the label in the carner of Carpac ring hatming in the museum





is infrared photograph of the two jubel. The signature is an at the earlies of the paint.

Science Looks at Paintings

Hy Mutray Pease, Interior Curelor

Orpariment of Conservation and Technical Assessed The Metropolitan Museum of Art M 151 wise howks have been written to explain how artists paint pictures and how we ought to look at them II we could read all of them we might become very learned indeed on the subject of art. But all we really need to remember is that artists love to paint pictures and want us to enjoy them. This will always be the truest and best reason for looking at paintings. Most people need no other reason

But for some of us there are special seasums for looking at paintings and special ways of thoug so In art museums there are many paintings a me of them hundreds of vears of I. Museums must preserve these and the others not yet so old so that they will exist and give pleasure perhaps hundreds of years from now. To do this those who work in museums must know just how the paint ings were made and of course must and it out without damaging them in any way Much can be found out by reading old books and records. The museum workers can find out even more by studying the paintings themselves very carefully-studying them. for the time being not as beautiful paint ings, but as things which have been built from wood and canvas and give and point just as chairs or tables are built. The more they find out about the materials of paint ings and how the artists but them together the better they will know how to take care of them-and the more they will admire them too, because good paintings have beau ty of fine norkmanship as well as beauty of color and design

In all this the museum workers are rather like doctors who also must examine their nationts before they can try to take care of them Many of the special instruments that doctors use are helpful in examining paintings One of the most useful is the microscope. This can make tiny details of brush work appear large enough to be compared with similar parts of other paintings It can show us old damages, pethaps so skillfully repaired that they might otherwise be over

looked It also makes it possible for us to take samples of the point so small that you could not see them or tell where they came from without a magnifying glass and and here them chemically to find out what kind of point the artist used

fut we may also want to find out about the layers in a painting that are underneath the paint surface where they can not be seen with the eye or the microscope. There are two usual ways of exploring these hidden parts without damaging the painting One is s infrared photographs the other is is Years Both of these methods use invrible tass of waves or radiations. Although we can not see them these rays are in many ways quite like visible light. For example, they can be used to make pictures on phitographic film They are different from light in being able to pass through many materials that light will not pass through so by using these properties in combination, we ran make real photographs of inner parts of paintings just as doctors can take A ray pactures of internal parts of human beings

Fach of these methods has its own special uses Infrared rays although they will travel farther through solid or opaque materials than ordinary light are still far less pene-trating than \ rays So infrared rays are what we use when we want to see just a little was down below the surface of a painting Why should we want to do this? There are several reasons why we might One is to find out whether the artist changed his mind while painting and perhaps covered up parts already begun Being unfinished these parts, il we could see them, would tell us quite a lot about the artist's methods. We might per haps hope to discover something that would add to our knowledge of the painting s his

At the top of this page are two kinds of photographs of a small place in one cor ner of a painting. This strange place looks as il it ought to have some writing on it But when you look at it, there is almost

HOW TINTORETTO CHANGED HIS PAINTING



This is how the painting of the Dage Aivise Meccaige Presented to the Redeemer would appear to us if wa atond better it of the Mercaign Presented to the Redeemer would appear to us if wa atond better it of the Mercaign of Art. The arces photographed by interest and by X rays are merked by White More and Arc above below Experts superted the substanting accepted flow was been



This X ray chadewatesh of an apparently empty apare chows the Saure of a man believed in be St. Merk. The cross sheed area is the chadew of the stretcher that supports the cases.



lefrered rays bring out the figure of an sear horering over the Dogs. The palater evidantly thanged his mind about the p cture's composition

nothing to be seen, is the ordinary photo-graph shows The infrared photograph, how ever, tells a different story. It shows very clearly indeed that there is a waining there, burted below the surface of the paint. It is egapture of the artist who painted the signature of the artist who painted the signature of the artist who painted the signature of the artist who painted the hower why it was covered up, we can only guess, but now at least the show it is there. It is in latin, and means "The Work of Vat It is not according to the capacito of Vennee" Vittor Capacito was a painter who lived in Vennee at the beginning of the surteenth century.

MUSEUM WORKERS THOUGHT IT STRANGE THAT ST MARK WAS NOT IN THE PICTURE

On page 23 you will find an illustration of a well-known painting by another great Ve-netian artist Tintoretto It is an imaginary scene in which a famous Doge (chief magistrate) of Venice is being presented to the Redeemer by four saints It is a partly finished study for a larger painting It has all ways seemed surprising that St Mark who is the patron saint of Venice, was not in the picture, especially since his symbol, the hon, can be seen in the shadows. Just now look at the picture of the infrared photograph of the empty space to the left of the Doge Here are shadowy traces of one or more figures that are not to be seen on the surface. This helps us to guess that Tintoretto began his design with other figures, probably St. Mark and an angel, in this space, and then, deciding that it made a poor composition, painted them over Because this had already been suspected for other reasons, a small part of the over paint has been removed from the head of the upper figure, showing part of a face just sketched in It is near the imper right hand corner, and looks as if it might have been planned to be a hovering angel

I RAYS OR "SHADOWGRAPHS" DO NOT SHOW TORES OR COLORS OF PAIRT

Between infrared photographs and X ray pictures there is an important difference As the other pictures there is an important difference As the other pictures there is an important difference As the other pictures (when he was the other pictures (when he is used to be a support of the pictures of the pictures) of the pictures of the

the rays are stopped by the thicker paint, especially if it contains metal compounds such as white lead (white lead is one of the commonest of white pigments, it was used in almost all old paintings). The rays that are stopped do not reach the film, and so parts of it are not exposed, while others are When we develop the film, therefore, we can see a pattern of shadows, which are the shadows of the paint itself Of course, it makes no difference whether the paint is on the surface or not wherever it is, it will cast its shadow on the film It is true that radiographs often look quite like the paintings from which they are made But this Is only because we usually study the X-ray negatives, without bothering to make prints from them In the negative the shadows are light mstead of dark, and so they look like the white paint that made them

THE SHADOWGRAPH REVEALED THE FIGURE OF A MAN INVISIBLE TO OUR EYES

One picture on page 23 is an X ray shadowgraph of a part of the same painting by Tintoretto It includes the part near the Doge's head, where we might expect to find the figure of St. Mark if our guess was correct If you look at it for a while, you will see the upper part of a man, seen from the back He carries a great book under his left arm, and leans to the right, toward the fig ure of the Doge We can now be quite sure that this was intended to be St Mark, with the book of his Gospel and with his hon at his feet. The pale cross-shaped area is the shadow of the mooden stretcher that supports the canyas. The small black spots that you can see here and there are holes in the paint

GOR ETES AND OUR MINDS THE REST

What do we really learn from such photographs as these? Not very much, perhaps but when we add this information to all that we have discovered by other means, we may find that we have learned a great deal At times these "scientific" methods will not help us, for most paintings have no hidden se crets, and all the X rays and infrared photographs in the world will tell us no more about them than a sensible use of our eyes In fact our eyes and our minds will always be the best 'instruments" for looking at paintings—or at anything else We must learn to use them wisely and thoughtfully, and then we shall be able to use other instruments in the same way



General MacArthur and President Oxmona rejoice neer the liberation of the Philippines won by land sen and air

ASIA and the PACIFIC AREAS

By H R Ektns

THE year 1045 saw the destruction of the vast empire that Japan had built up in Asia In the early months of the year the Japanes suffered a sense of disastrous defeats British Empire troops conquered Burna after a difficult campaign in dense jungle country Australians invaded the huge Japanese from one outpost after another in the Philippine Islands they captured Iwo Island and myaded Okinawa in the Ryukya group Japans once mighty navy was re duced to a few battered ships American bombing planes key the pounding away at the damare.

By' E Day, the day of victory in Ea rope (May 8 1945) Japan was already a beaten country She faced redoubled attacks by the United States and Great Butan who were now free to direct against Japan the armes that had been used against the Germans In the months that followed Ameri can homber kept or their case on the Japan ones home islands. While the Americans and attack,

On August 5 1945 the United States launched a terrible new weapon against the Japanese An American Superfortress dropped a single atomic bomb upon the city of Hiroshima. The explosion caused by the

smashing of atoms brought about fearful damage. An area of over four square miles was flattened out more than 100 000 per sons lost their lives. August 8 1045 was a black day in Japa

August o 1939, was a trace, any in jupa nees history. On that day, another atomic bomb was dropped this time on Nagasaki. On that day too Russia declared war on Japan and at once attacked the Japanese positions in Manchuria or Manchuria or

The Allies agreed to let the Emperor re man But they made it clear that this mon arch was to be a mere puppet acting under the orders of the Allied supreme commander On August 14 the Japanese accepted these terms. The official surrender took place on the deck, of the battleship Vissouri in Tokko Barron and the Contraction of the Contr

The end of the war did not bring peace to Asia In the regions freed from Japan there was want and misery as the result of years of brutal Japanese occupation There was great unrest too in many of the occupied areas. In part this unrest had been stured up by the Japanese They had done their best to turn the peoples of the Netherlands Fast Ind es French Indo China and the British possessions of Malaya and Burma against their former white masters. The Japanese had prom sed to built up a Greater East Asia Co prosperity Sphere in which all na tive peoples would live happ h under Japa nese leadershin.

In the course of time these peoples had found out that the Japanese were hard task masters who were interested only in adding to the r own power and wealth But the Japanese had succeeded in bringing to a head a movement that had been gaining ground for years It reflected the desire of the peoples of Asia to be there own masters it was simmed up by the cry of Asia for the Asiatics

This movement had been particularly strong in Ind a where national st groups had been demand og independence long be fore the outbreak of World War II With the coming of peace the demand for political freedom grew more insistent not only in India but wherever the powers of Europe

ruled over As at ca Elsewhere in Asia too the year 1945 was marked by turmoil There was civil war in Ch na revolution in Iran open combat in Syria and Lebanon rioting in Palestine In the pages that follow we shall tell you about these developments and about other important happenings of the year in the vast 1si

atic cont nent

outposts of Asia those numberless islands which dot the immense Pacific Ocean and to which we give the name of Oceania A great many of the islands were wrested from the Japanese in the course of the war Among these were the groups of the Solomons the Bismarcks the Gilberts the Carolines the Marshalls the Marianas and the Halma heras Some of these islands had been con quered by the Japanese in 1041 and 1942 Others had been under Japanese rule before the war

What will become of these islands? Some ace now governed again by their former rul ers-Great Britain the United States and the Commonwealth of Australia The fate of the others must await the decision of the Trusteeship Council of the United Nations Organization (See the United Nations) A number of the islands will probably become American m litary and naval bases under trusteeships awarded by the United Nations

Organization In some of the islands of Oceania life will return to the old ways of peace. In others there will be new developments. The islands on the air routes between the United States and Asia will flourish as stopping places for travelers as tourist resorts and as bases with

permanent military and naval installations We now come to the Philippine Islands which are separated from the Asiatic conti nent by the broad South China Sea To many native peoples the coming of the Japa nese meant merely a change of masters to

the Filipinos it was a tragic blow



S gnal Co os photo atl aircreft



U. S. Mar no Corps photo The natives of an Oki name village tradge aver atomy graued in bare feet, apparently wilhout discansiar. Almost all wear kinsoner but with act the famous such of Japanese wames

Spain they had been taken over by the United States after the Spainsh American War of 1898 Under American rule the Fib punos enjoy ed the benefits of education et tensive health programs and training in self government. In 1934 the United States Con gress passed the Tydings McDuffle Act which gave innereased political power to the Filipinos it also provided that the islands were to become independent by July 4 1936. The Filipinos had their own president and vice-president their own congress. They looked forward confidently to the day of complete independence.

The Japanese invasion dashed their hopes. In the dark days of 1941 42 when Japanese troops overam the islands the great material to the properties of the properties of the properties of the United States President Manuel L. Quesdo and Vice President Sergio Osmena escaped to the United States where they set up a Filipmo government in exile In the stands groups of Filipmo governments on experience of the properties of the pr

The Japanese promised to include the Filipinon in their Greater East. Asia Co prosperity Sphere they even set up a pupper tepublic under Jose P Laurel But they made it clear that they were the real masters and they aroused the firece hostably of the proud Filipinos. When the Americans invaded the islands in October 1944 there task was greatly lightened by the co-operation of the inhabitants As a result the re-

occupation of the islands went on rapidly
The Americans did not treat the Fulpinos
like a conquered people but like fasthful
and trusted allies in February, 1945 Gen
eral of the Army Douglas MacArthur leader

of the American forces turned over the civil government of the islands to the Filipinos themsefves President Quezon had died in August 1944 and had been succeeded by two President Osmena Luder Osmena the Filipinos set to work to rebuild their land if was a beart breaking task The Jana

ness had ravaged fine cities like Manila Baguo Ceba and Ilolio they had burned bundreds of vollages. They had land waste the sugar-tame plantations in many areas and had destroyed the machinery used in refining sagar. It was meressary to find food and shefter for the victims of Japanete oppression. It was necessary to restore Filippin industry and in particular the all important sugar industry.

Yet the Fulpmos were hopeful They had the and of their good friends the Americans who provided money, relief supplies goods and helpful suggestions. The Fulpmos planned to elect a new congress early in rog6 the year set for their independence. They are looking forward to an era of peace and prospectify as members of the United Nations Organization. North of the Philippines lies Japan now.

strapped of her conquests and her power She as the chet vottm of the war hast she had brought on so hopefully Although the Japanese bome slands were not madded until after the final surrender, the cheef enter the bombong from the art and shelling from the sca There are not nearly enough homes in Japan, there as not nearly enough food it seems certain that many Japanese will de of maintaintone evojoure and classes and that on the second of the sec

but he has no power He must obey the orders of the supreme Allied commander General of the Army Douglas Mac \t thur who has a strong oc cupat on force of American soldiers to back up his



Hee mg A c aft Company
The B 29 Superfertress

commands At first the oc cupation of Japan was an American affair Other countries were represented on a Far Eastern Advisory Commission which would make recommendations concerning the Jap anese problem but General MacArthur made all the decisions Ife followed a directive (statement of pol cy) issued by President Truman on "epitembre 6 1945 outling the

these policies On December 27 1945 an important an nouncement was made by the Moscow Conference of Foreign Ministers representing the United States Creat Britain and Russia, It was revealed that an agreement had been reached to set up a four man All ed Counc ! for Japan The American representative would be the supreme All ed commander in Japan he would be the permanent chairman Russia and Ch na would also be represented on the Council a fourth member would speak for the United Lingdom Australia and New Yealand The supreme All ed com mander would still have great power But in certain important matters no decision could be reached without the unan imous approval of the Council

In 1945 all the important decisions were made by General MacArthur

who followed the Press
dents duret we The General has won great
admuntation for his work in uproofing Japa
nese inditarism. He has taken away from
the Japanese the guns warships amphases
and munitions factories which served them
in their campaign of terrorism in the Far
Fast He has follow away with the Japa
nese Imperial General Staff He has search
the banks which financed Japanese
the banks which financed Japanese
men gully of planning or carrying out the
attack on the Allies or gully of cruries
against humanity in the course of the war

He has taken other steps to bring about changes in the Japanese way of the He has demanded that free elections should be held that Japanese was worned should be granted the vote that Jabone women should be granted the vote that Jabone unions should be encour aged He has insusted that all Japanese must have treedom of speech he has sholished the dreaded secret pole e He has forh dden the teaching of mil taristic doctrines

The etumic bumb left meeting but subble and twisted metal to show that people case lived to this part of Miredian.

We have told the Japruese that defeat in war has brought them the opportunity to win the benefits of true democracy. But democracy is new and strange word to this people. Only time can tell whether the Japa nees will benefit by the new freedom. At present they are stunned by defeat and in their hearts they are bitter. As time goes on however they may turn from the old ways of untibuling nationalism and brutal mili tarism. They may enter upon a new path of peace and to operation with the nations of the world Such at least is the earnest hope of their connectors.

With the defeat of Japan Korea was freed at last from the Japunes yoke Korea a country on the Assatic mainland was an nexed to Japan in 1970 but korein patriets never gave up the fight for their lost blerty When President Roosevelt Prime Vinnster Churchill and Generalissimo Chiang Kaishek met at Cairo Egypt in December 1934 they promised that in due course 1934 they promised that in due course

Korea would again be free

The downfall of Japan did not bring in dependence to the koreans. Their country became an occupied territory with American troops in the south and Russians in the north. In December the Moscow Conference of Foreign Munisters proposed a five year trusteeship plan under the United Nations Organization for Korea The Korean roaded when they heard about this proposal they demanded immediate indeemedence.

NEW PROSPERITY FOR

Japan a neighbor to the north is Ressa which is very definitely an Assate power as well as a European one Assate Russa has benefited greatly by the war in the tourse of the German Industrial Russa has been as the second of the German Industrial agreement of the Russa has been as the second of the Russa has been as the second of the Russa Ru

There is no prosperity, also in the ancient land of Clina Those of us who have lived in China have known for a long time that the end of the war against Japan would mean the continuation of the revolution which began in the year 1911. The original revolution shook off the rule of China's Man the imperiors and brought a republic to the



U S Navy photograph Japan surrenders formally aboard the USS Missouri

Chinese But unfortunately it did not bring peace When a strong man called Yuan Shih kai took over the presidency in 1912 he aroused the suspicion and then the hos tility of many of the revolutionaries

Civil war broke out in China and for years there was almost continuous fighting now in one area now in another. Different provin call rulers called tuchinis, or war lords raised armies of their own. They fought among themselves frequently changed asksold their support to the highest bidder and sometimes played the game of foreigners.

In the late 1920 s China seemed about to regain ber unty under the Kuominang a nationalest party that aimed to restore China to the Chinese The leader of the Kuomin tang Chinang Kau shek. was a military gen ins he sisceeded in overcoming many of the war lords and in setting up a fairly strong central government Unfortunately there was trouble from several quarters. Jie pan in 1931 invaded the Chinese produced the control of the control o

When open war with Japan broke out in 1937 common hatred of the foe brought to gether the central (Kuomintang) govern



Chinese and Americane calebrate the arrival to Kunming of the first convay ever the Stilwell Read from Ledd.

ment and the Communists for a time But this patriotic alliance did not last very long In the terrible days when the Japanese thrust deeper and deeper into China the central government and the Communists drifted further apart. The Communists gov. erned vast areas independently they had their own laws currency and postage stamps they raised and equipped their own armies in defiance of the central government. The two hostile groups often came to blows

Russia had been accused of giving aid secretly to the Chinese Communists Many people were surprised therefore when she signed a treaty of friendship and alliance with the central government on August 14. 1045-the day when the war against Japan was brought to its close. For a time it seemed that the Kuomintang and the Communists would bury the hatchet The Com munist chief Mao Tze tung arrived in Chungking, capital of the central govern ment, for a series of conferences which it was hoped would bring about peace in China

but nothing come of these meetings Even while these talks were going on, there was a race between the central gov ernment and the Communists to take over the areas which the Japanese were abandon ing Open fighting broke out between the two Chinese groups in many areas American armed forces found themselves involved in some of these conflicts They co-operated with the central government is disarming the Japanese thousands of Chinese govern ment troops were transported in American planes to the areas which the Japanese had gnen up In 1945 China had at least the satisfaction

of tegaining a vast region that had been lost in her for almost fifteen years because of Japanese aggression—the province of Manchuria The Japanese had set up a puppet state, called Manchukuo, in this area Strong Japanese forces were stationed here throughout the war

When the Russians declared war on Japan on August 8, 1945, their troops invaded Manchuria and overran the region in a few days Since Russia had been vitally inter ested in Manchuria for a long time, few people expected that the Red Army would give up its hold on the province. But it die so much there was considerable fighting be. tween the government troops and the Com munists as each group sought to take ove the province Before the end of the year, the central government had won the upper hanc over the Communists in this disputed area China also regained the territory of Kwangchowan in the southeast This terri tory had been leased to the French in 1800 for a period of ninety nine years. On August 18 1045 the French agreed to give up all claims to Kwangchowan The Chinese hoped also to take over Hong Kong which had been a British crown colony for many years and had been captured by the Japanese in December, 1941 But the British announced that they had no intention of giving up Hong Kong and the Chinese allowed them

to reoccupy the colony As 1945 came to an end there was renewed hope that the central government and the Communists would come to terms President Truman sent General of the Army George C Marshall former American thief of staff to China as ambassador in order to try to bring the two warring factions together. As they both hailed the selection of General Marshall it was hoped that he would be able to bring

peace to the land

There was grim fighting in soutbeastern Asia after the end of the war. The natives of the densely populated and fertile Neth erlands East Indies staged a full scale revolt against the Dutch rulers of the land The area had been overrun by the Japanese in the early months of 1942. The Japanese suc ceeded in turning many of the natives against the Dutch The doctrine of Asia for the Asiatics seemed to them a very reasonable one They scorned the offer of the Dutch to give dominion status to the Netherlands East Indies after the war

When peace came at last a number of the natives led by Dr Achmed Soekarno an nounced that they intended to set up an in

dependent government When the Dutch tried to reoccupy the islands wild rioting and general disorder broke out. The British landed troops in order to help the Dutch and in some places particularly in Surabaya a big naval base there was heavy fighting The British used tanks and bombing planes and many lives were lost

The British and Dutch claimed that it was impossible in a land where there were still many armed Japanese to turn over responsibility for preserving law and order to a native group. Some of the revolting natives doubtless were lawless persons who took ad vantage of the troubled times to steal and kill others were trouble makers who had worked with the Japanese But many of those who demanded independence considered themselves to be patriots fighting for the right to be free They said that they wanted to develop the resources of the land for the benefit of the inhab tants not for the benefit of a foreign power

There was unrest and revolt too in French Indo China The people of the Indo Chinese protectorate of Annam sought com plete independence from French rule Riot ing broke out and here too British troops heloed to mainta a order. A new Annamese Nationalist Government headed by Dr Tran Phan was formed in Hanoi in October 1945 It won wide support among the natives but it could not oppose the French successfully on the field of battle Dr Phan declared bitterly that the French were using tanks and other supplies sent from America on Lend Lease

India remained a trouble center in Asia as it had been for years. In 1942 at a time when Japan was extending her conquests in



Near Calcutta. India where the heat is utiding for a good part of the year many of the people live in thatched bath. Yeary young children were no ciething and that of the grownings is loose and light in color

the Far I as Great Britain had offered india Iuli dominion status after the war in exchange for active Indian co-operation against Japan. This project was called the Cripps plun liceases it had been brought to India by Sir Stafford Cripps, a member of the British Chinet.

India rejected the Cripps plan thiefly be cause the Brinsh wanted to control Indias defenses in linguist 1942 the All India Congress authorized its leader Mohandas Atandhi to begin a campings of civil disobethence which was intended to put an end to Brits fruile in In la Crindh Jiwashartil Vehru and other leaders of the Congress were impressed and Grest Britain

sterally nut down the noting which followed in June 1945 the Birtish relaced Vehru and other perannent Indian leaders from orison in that month too they begin a series of conferences at Simb with they begin to the leader and other lind an expression time as an effect to bring about a new ere sollowed and the sollow of the sollow of the sollow of must end led in failure on July 14, and the Birtish announced that they would continue to govern indict as before

THE NEW BRITISH GOVERNMENT ESEPS THE OLD INDIAN POLICY

The situation was not changed much alter a Labour government came into power in Great Bottam in July 11 soon became clear that the new government would make no important changes in British policy in India. The Indian letters were butter there were anti British nots in Calcutta and other cuties. To add to the woes of India Hindus and Voslems came to blows in a series of nots in Bombay in September 1920.

Farther to the west the historic land of Iran (Iersa) faced a difficult situation II had passed through trying times in World War II. In the early months of 1941 a considerable number of German agents posing as tourns Is had flocked into the country Greet Diritant and flocked into the country Greet Diritant and flocked into the country of the Company of the Compan

When this demand was refused British and Russian troops in saded the land and occupied it meeting little resistance. The Drinsal and Kussians state over the on-fields a number of bases and other places in Iran In the course of time the country became an all important channel for the flow of law materials to Russia. American troops usuned.

the British and Russians in this area in order to help keep transportation moving. The Ira mans declared war on Germany in Septem ber 1943, but Iran continued to be an occupied country with little power to decide its own policies.

In the famous conference held in Tcheran the capital of Iran from November 3 to December 1 1943. Presidert Rooseeld Irans Vinnier Churchill and Premer Cosph Stalin promised that Iran would continue to be an independent country. They also promised that she would lose no territory as a result of the Allied occupation.

After the war came to an end at last British Russian and American troops con toused to occupy key posts in Iran In October 1945 honever they agreed to withdraw their troops by March 2 1946 The people of Iran waited patiently for that happy day to come

On No ember 16 1945 a revolution broke out in Aerchaigha Province in the northwest of Iran occupied by Russian troops. When government troops tried to enter the province in order to put down the revolt, they were turned back by the Russians The government of Iran protested claiming that Russia had no right to interfere in a matter that concerned only Iranians On November

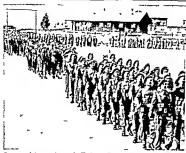
cast Concerned only Hannans On Novelmor.

4 President Truman proposed that all
American British and Russian troops should
affect the state of the st

TURREY AND RUSSIA QUARRAL OVER THE DARDANELLES

Turkey also had a nuarrel with her his Rossian neighbor in 1913, over the question of the Bosporus and the Dardanelles Three too narrow straits with the Sea of Marmora which hers between them connect the Black Sea with the Wedterranean Turkey, had been forced to remove all the lortifications from the straits after World War I, in which she had fought on the sade of the declared Contral Tweers But in 1936 following an outernational conference held at Vionitery Trance, the Turks received permission to

fortily the straits again
Furkey remained neutral during almost
all of World War II she did not go to wat
until February 23, 1945 when she joined the
Albes only a few months before V E Day
the day of final victory to Europe The



sh brigade formed he permission of tich subscriting to

Russians did not welcome the Turks as allies They declared that Turkey had permitted Axis ships to pass through the straits in the early days of the war

Rusus now demanded the right to set up bases at the strats in order to protect her interests The Turks were naturally reductant to have so powerful a neighbor at their back door and they refused the Russain demand In November 1945 Secretary of State Byrnis of the United States proposed a compromise He suggested that the Russains should give up their idea of establishing bases at the stratis of the other hand he asked the Turks to open the Dardanelles and Bosshapi of Russain Bulgana and Rumania at all times No action bad been taken on this proposal at the year send.

The Viddle East also offered senous problems in 1915. There was strike in Syrus and Lebanon at the eastern end of the Viddler ranean Sca Belore World W. It Il these comtries were under the control of France though they were called undependent After the surrender of France in June 1940 Syrus and Lebanon remained under the control of the Vichy Government which had taken over the rule of unoccupied France.

In June 1941 an Allied expedition tool, over both countries in order to prevent the Axis powers from seizing them. This expedition was made up of British Empire troops and pro-Ally Free French forces In Sep

tember 1941 General Catroux the commander of the Free French troops in the area proclaimed the independence of Syria and Lebanon in the name of the Allies

After V.E. Day a crisis developed French troops continued to occupy a number of districts in Syria and Lebanon. Before finally withdrawing their troops the French wanted to be guaranteed special rights in both countries of their troops the French troops the french sand of the standard for a full treatment when the French sent added troops into the area heavy. Eighting broke out 1 in the course of this fighting, the French shelled the city of Damascus Syria which is held sacred by the Syrians. At last the British intervened they borrack's French troops to return to that the British intervened they borrack's the sent troops to return to that

The British restored order after several hundred persons had been killed and many others wounded On July 25 2045 an agreement was reached between the British and the Freech The French were to remain an the coastal areas but were to withdraw from eastern Syrta though they were to retain castern Syrta though they were to retain the coastal areas the several three the several three them are the several three three three three and France agreed to withdraw their troops from Syrta and Lebanon at an early date.

The Palestine problem was the thornest of all in the Middle East Great Britain has been governing this country for years under a mandate of the old League of Nations. (A mandate was an order or commission issued

by the League at authorized a League mem

ber to set up a responsible go ernment in a given territory) When this mandate was off cially approved in 1921, it was understood that the British would help the Jews to set up a national home in Palestine Sir Arthur Balfour British Loreign Secretary had promised in 1917 that the British (whern ment would do all in its power to bring this

When the British took over the Palestine mandate the Arabs in that Lind greatly out numbered the Jews. The propertion of lews increased centiferally in the years that fel lowed as Jews arrived in Palestine In increas ing numbers. The newcomers belied to buil! up the land and brought new prosperity to it But the Aril's became more and more hastile They claimed that they would be outnumbered by the Jews in time if un restricted inimigration continued might then become a persecuted minority And so they wanted to check Jewish immi gration to the lich Land as lalestine is sometimes called

As time went on there was risting and bloodshed in the Holy Land in May 1010 the British offered a plan to put an end to the strile between Arabs and Jews this plan was set forth in a document called a White laper. The British proposed to allow 75 000 Jews to enter the country over a period of five years. After that time there would be no more Jewish immigration. The British would then set up an independent Lalestine bound by treaty to Great Britain The Jews were to have full political rights in this new state

WORLD WAE II POSTPONES THE PROBLEM OF PALESTINE

The White Paper satisfied neither the Arabs nor the Jews But in September 1939 World War II broke out and the British postponed lurther discussion of the Palestine question During the war the fews of Lales tine supported the Allied cause wholeheart edly They sent their young men to fight against the Axis their industries helped to

supply the Allied troops in the Middle Fast With the end of the war, the matter of the future of Palestine came up again. An im portant Jewish body, the Jewish Agency laid a definite program before the British Government Among other things the agency demanded that a lewish state should be set up in the Holy Land, and that unrestricted lewish immigration should be permitted in August 1945 this program was approved by the delegates to the World Zionist Conler

ence, meeting at Limit in (Zionists are Jews who support the Jewish colonization move ment in Palestine 1 CONFLICT DEVELOPS OVER SEWISH

INMIGRATION INTO PALESTINE

The Jewish Agency program was a long range affair. In order to meet the immediate reeds of Jenish refugees in the war torn areas of Furope the / jouists demanded that roo ooo Jews should be admitted at once Into Palestine The British refused they an nounced however that 1 500 Jewish im migrants a month would be permitted to enter The Zionists declared that this offer

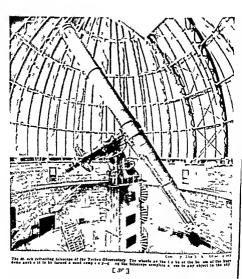
was entirely unsatisfactory

The Arabs of Lalestine were bitterly opposed to the program set forth by the Jew ish Agency They recrised the firm support of their fellow trabs in other lands In March, roat the states of Feynt Syru Lebanon Transjordania Iraq and Saudi Arabia had adopted the charter of a new Arab League The League sowed that it would not permit the setting up of a Jewish state in Palestine To show their support of the Lalestinian Arabs Arab mobs in Cairo Mexandria Tripoli and other cities of North Africa looted Jewish stores, damaged syna gogues and attacked Jews On Savember 13, 1048 President Truman

and Fureign Minister Besin of Great Britain announced a British American agreement on the subject of Palestine They proposed to set up a Joint Committee of Inquiry to ex amine the problem of Furopean Jeus and Palestine Beyin added that I alestine would become a trustee state of the United Nations Organization and that it would have self government in time It seems likely that there will be no further official move in the matter until the Joint Committee of Inquiry

makes its report One reason why the Palestine question is such a difficult one is that neither Great Britain por the United States is willing to make enemies of the nations belonging to the Arab League There are vast oil deposits in Iraq and Saudi Arabia and other Arab lands in the Middle East and both the Brit ish and the United States are vitally inter ested in these ail deposits

And so the vast continent of Asia is in turmed Still the situation is not hopeless. There is still hope of peace-a real peaceif the reasonable hopes of native peoples are lulfilled and if purely national interests give way to the interests of the world family of nations



the light of the moon falling athwart the telescope and the floor, gives us light for our steps, although a dim, ruddy lamp on the

pier serves as a guide

There by that lamp at last we pause Over us the monstrous shape of the giant instru ment looms, it seems to be motionless yet before us, inside the pier of the telescope. behind a window of glass we see the whirling gears of a mechanism called the driving clock that is turning the telescope with infinite smoothness slowly across the sky toward the west, to follow the apparent motion of the moon or any other object to which the instrument is pointed. For the earth is always rolling eastward beneath the stars, carrying us with it, as a result, the stars all appear to roll westward over us and if our telescope were not moved constantly to follow this westward motion, the object under examina tion would drift away from the field of view of the telescope

But now, after the astronomer has pressed a button on a small panel near the pier, we hear a rumbling sound, then feel a strange sensation of motion We are rising! The whole great floor of the room is an elevator that carries all of us, and chairs, and observ ing ladders, up to a convenient level so the lower end of the telescope is within easy reach! It is the largest elevator in the world it is circular and it has a square hole in the middle of it Through this hole the pier of the telescope protrudes, the instrument sits

This telescope peering through the slit in the grehed dome is helping to discover the pecrets of the aky

on a solid foundation buried in the earth while the floor does not touch it. For if the floor touched the pier of the telescope every step would cause the instrument to vibrate



A section of the Milky Way sees through a telescope

and the vibration magnified many times by the telescope would be easily visible to the observer using the instrument No part of the telescope ever touches any part of the building

Now we see that if we walk away from the center toward the lower end of the telescope we shall just be able to look through it without standing on any steps. The rumbling sound ceases as the astronomer takes his finger from the button, and we all go out to look through the Instrument But now the edge of the slit that runs from the rim to the top of the dome is hiding some of the moon the astronomer touches another button and a different sound is heard. For a moment we feel that we are turning but then we realize that it is the dome which is turning a little so the moon s light falls full on the great lens of the telescope. The astronomer steps to the lower end of the telescope, looks through the tiny lens called the eyepiece, makes a small adjustment, then invites us one by one to share the view

THE RACCED MOUNTAINS ROOM THE MOON

When we first see the moon, our thoughts are strangely mixed The scene is at once beautiful and terrible. There stand those ragged mountains those vawning craters and barren deserts where nothing has changed for millions of years, where nothing grows where the temperature by day is above the boiling point of water and by night is far below zero. Along the line that divides the dark



This telescope is used in photographing comets

from the bright portion of the moon, we see long shadows that belp us discert he nature of the details. The astronomer tells us that only when the moon in some partial phase with the moon in the state of the tell of the object of the state of the tell of the tell of the there is no cur and no nater on the moon and that is why the steeney is so ruged and severe three has been no evosion there, no wearing down of the high places of filling in water. We all agree that, while the moon is a fascanting object to New thorugh a great telescope, we are very glad we live on the earth.

HOW THE TELESCOPE IS TURNED TO SCAN ANOTHER PORTION OF THE SET

When all have seen the moon, the astron omer suggests that Saturn pught be next on the program But the moon is high in the south, while Saturn is rather low in the west The astronomer goes to the center of the floor, where he presses huttons on his control panel The huge tube of the telescope changes direction, tilting so the eyepiece rises and swings to one side, as the astrono mer, by reading numbers on his dials, points it exactly at the spot in the sky in which Sat urn is to be found Now the dome must be turned toward the west, and once more we hear the sound as the shell of many tons rolls smoothly along railroad rails, until we see the planet Saturn through the sld But the

floor is too low—the proper button must be pressed, so the floor will rise and carry us once more to the eye-end of the telescope

SATURN WITH ITS BRIGHT RINGS ARD ITS BINE MOONS

When all is ready, once more we take our turns The first to look exclaims, 'Why it looks just like the pictures!" and so it does Saturn is a lovely thing, poised delicately in the center of a set of rings that remind one of the brim of a hat We see no motion, yet the planet is turning much faster than the earth. The millions upon millions of tiny particles which compose the rings are also revolving swiftly around their planet, ever in their proper places, so the appearance of the rings is preserved. To either side, outside the rings small, starlike objects are seen they are some of the 'moons' of Saturn The planet has mine moons in all but seldom are more than five or six visible at one time Some might be hidden in the shadow of the planet and some are exceedingly faint, to be seen well only on photographs

Then we look at giant Jupiter, with its deep belted atmosphere of ammonia and marsh gas Its strong markings enable us to see its rotation the markings move across in one direction those near one edge passing out of sight around the limb or edge of the disc while new ones come into view at the other limb bour of Jupiter's eleven moons are easily visible they change their places as we watch them and one of them casts its shadow on the planet, to produce an eclipse of the sun But there is no one there to see the eclapse, for on Jupater at as very cold and the dense atmosphere, made up of notious gases, is not suitable for anything that lives here on earth

here on earth

So the evening passes. As we linger we feel
that we are leaving farther and farther for
and all the wormers of this word we reach
mad all the wormers of this word we reach
some of the objects we see — tame star clus
ters and nebular—are so distant that ther
light has been thousands of years on its way
to us. The light we see from them tongist left
there before the Pyramids were built, before
man learned to rause inquiring eyes to the
eventuality of the properties of the coverties of the properties of the properties of the coverties of the properties of the properties of the properties of the
eventuality stars. We are a part of eteroily
as we stand beneath the doors and uge the in

man learned to raise inquiring eyes to the everlasting stars. We are a part of eternity as we stand beneath the dome and use the in strument that cunning hands devised. Regretfully we take our leave more silent than when we came we walk the road down the hill, our minds filled with raining thoughts.

of creation and of worlds without end

ASTRONOMY

THE ASTRONOMER'S
WONDERFUL INSTRUMENTS

By Marian Lockwood

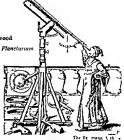
Associate Curator, Hayden Planetarium

ONE of the most interesting and institu ing of all stories is the long exciting and often beautiful tale of man's quest for knowledge Wisdom and knowledge are of many different kinds or branches and different kinds require different methods of an proach The philosopher for instance does not use delicate and complicated instruments to help him to his conclusions. He could not even if he had the most perfectly accurate scales measure human thoughts and values by mechanical means. His material comes from his own reflections and those of others and perhaps largely from his own heart. The astronomer on the other hand starts with purely objective material with hard cold facts not with speculative data Later after he has obtained his facts he may speculate Theories are the result of speculation they are actually scientific guesses but they must be based on facts known and observed

It would seem that the astronomer has chosen for humself a hard job. Viost of the material with which he deals is so far away that he can not even seen it. The explorer may travel out to that the strange worlds he studies the moon is on an average about 20,000 miles from the earth. The nearest of the strates beyond the sun is nearly therefore the critishing miles away and here our imagnations begins to falter for we have entered the centrolings that the strategy with the strategy and the strategy are the continuous states much larger than our sun appear as tiny points of light even when viewed through powerful instruments.

As entibeless the astronomer (ells you with some confidence what the stars are like how large they are whether they are compare askely hat or solid, what they are made of how fast they are traveling and in which districted in the stars of the stars of

The answer to these questions is simply that the story of astronoms is the story of wonderfully necurate and delicate instruments which astronomers have decised in the last few hundred years. The story of astronomers have decised in the last few hundred years. The story of astronomers have decised in the last few hundred years. The story of astronomers.



The He mann \ ch e

omy is also the story of light for it is only as we construct instruments to gather and analyze light the sole messenger which can come to as from outer space that we learn about the universe which stretches out in every direction like a tast and endless sea every direction like a tast and endless sea at any time of the cart is an increased in the cart is any one with good elegation of the cart in the cart in this search in thousand tury points of light which we call stars At one time the average person can probably see about 3 500 stars.

at night several thousand tiny points of light which we call latar At one time the average person can probably see about 3 500 stars. There are about 9 000 in the entire sky of which we see less than half at any one moment. But the stars which we can see with extremely seen that the stars which we can see with which is only one of perhaps hillions of systems like it there are many billions of stars in order to see and study the celestal universe most of which lies beyond the range of naked-ey evision the astronomer has in vision that the stars down to earth. Let us see how he has gone about this problem.

In 1663 nearly three and a half centures ago a Dutch maker of spectacles Jan Lifepershey, constructed almost by accident a wonderful small instrument which made far objects seem closer, and dim objects clear fie made this first felecope by plateing two spectacle lenses in a long hillory shade and people. According to the story that is till it was just by accident that Lippershey happened to put the right two lenses to happened to put the right two lenses to acther. He never did anything of importance countin. (This is the one described in A Visit with his little instrument the first telescope of the little instrument in the first telescope of the little instrument in the little instrument.)

The word telescope is an interesting one—from the Greek word tele meaning. Lit and scapeus meaning "to watch. In other words a telescope is a far watcher exactly the right name for it.

THE FIRST CRUDE TELFSCOPES OPERED BEW

In 1600 or 1610, a famous physicist in the city of Horence Galleo Galdei by name heard of Lippershey's discovery and set to work to make for himself a telescope which he could use in the stuly of astronomy. We are told that he used a piece of organ piper and two spectacle lenses. With this cru te in strument he pected at the sun and found dark rix is on its I rilliant surface he I = ked at Saturn and thought it a peculiar planet with ears or wings the telescope was not good enough to show him that these ears are really rings around the planet Galileo observed the mountains and ersters on the moon and the four large mount or satellites of Jupiter which have ever since been called the Coldean satellites. His telescope was not strong enough to show him the other moons of Jupiter

Galdeo i telescoje male a great senation in hi da la techje from fix and near flocked to have a look through it jim Viliton the English poet was one of Lailleon systiems Galdeo i first instrument manifold objects three dimneters (A telescopes power to magnily its figured by diameters) Calileo Later made a telescope with the power of eight diameters and then one that magn feel thirty diameters.

harly diameters. With Califers forwards of the autonomia With Califers forwards are err at last tenomy and to man a ker are a last tenomy and to man a kon-teller and understanding of the herens. Suddenly the unwerse had expanded, stretching out in all directions, and man found himself in possession of a nearly situ moon and stars the very most of earth situ moon and stars the very most of the careful situation of the most result. From that tiles on, for more than three centuries the astronomers muon concern has been to improve the historiuments that help him to see, to collect the fairt light to analyze the verits of the stars, and

There are two main types of telescopes the refracting telescope and the reflecting We have traveled a long distance from Gri ileos tiny 'optik tube to the great forty inch the largest refractor in the world at Yerkes Observatory at Williams Bay, Wis

to an Observatory.) And it is a long jump indeed from the small reflecting telescopes of Sir Isaac Newton's day to the gigantic aroo inch at Mount Palomat, California. The refracting telescope is in its simplest

The refracting telescope is in its surplet torm a tube with a lens talled the object time at one end and an expurce at the other one of The objective is a connect fens, that is a lens that curves outward The travs of leyth of the other leady traveled the one after certified through it and come to a poler out to be come after every red of the tube forming an unange. The eye (see mounted in a follow many the control of the tube forming and the control of the tube forming and the control of the cont

The exprects of a telescope are changeable being of different magnifications. Highmagnification can be used only when the seeing is good. What do we mean by "seeing"?

THE ATMOSPHERE OFTEN DISTORTS THE SMACK IN THE TELESCOPE

The earth is surrounded as everyone In me to an envelope of air-a misture of gaves which we call the atmost here You have seen what happens in the atmosphere when its different layers are variously heated if you tak ahead of you along a hot road in the summer you will sometimes see a shimmering and wavering of the alt just above the road. Or if you sit before a window under which there is a hot radiator you see the air alone the railiator wavering and moving in the same way. This is due to the un equal heating of different layers of air When you twok out to objects beyond through these lavers the objects appear to be distorted. The astronomer often notices this same effect in the atmosphere through which he must look to see the stars out beyond The uneven heating of different layers of air causes a shimmering or twinkling of the stars and other heavenly bodies which makes the "seeing' poor When there is a more equal heating of the air, higher magnifications can be used, but when the seeing is poor a high magnification magnifies the distortion So the amount of magnification which can be used depends upon the stillness of the atmos phere Astronomers sometimes think with longing of the moon as the ideal place for an astronomical observatory, for there where

astronomical observatory, for there where there is no air, seeling would always be good. In the reflecting telescope the rays of light fall upon a concave mirror (one that curves inward) and are reflected from it to another mutro and the image is reflected again this time to an eyepiece that magnifies the image Various types of reflecting telescopes are in use the most common heing the Newtonian and the Cassegramian forms. In the Newtonian form the eyepiece is at the side of the tube near the top of the telescope and in the Cassegramian type the eyepiece is at the lower end of the instrument.

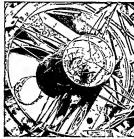
The largest reflecting telescope in use at the present time is the Hooker Telescope at Mount Wilson Observatory in Passidena California. This reflector has a mirror 100 inches in diameter that is eight feet and four inches across The 200-inch reflector to be installed on Mount Palomar near San Drego will be finished before long and as what it will reveal beyond the present known limits of the universe.

The telescope is the basic instrument of the astronomer It is used not only in actual observing but in combination with other in struments The main purpose of the tele scope is not as so many people erroneously believe to magnify though it does make things appear larger. The primary importance of this instrument is in collecting the light coming from distant objects objects which would be too faint for the astronomer to study without optical aid. The telescope gathers and intensifies light so that the as tronomer may study it by means of other instruments attached to the telescope The resolving power of the telescope is ex tremely important also That is objects which are so close that they appear to the be separate. The telescope is furthermore a

good pointer to indicate positions in the sky The camera "Sees" much That is invisible to the human eye

The telescope in team work with the photographic camera forms one of the astronomer's most important tools. The large telescopes are today used almost entirely in this way. The camera is attached to the seeing end of the telescope or where the expisery would be. With the camera we can plutograph objects that could not possibly be observed through the telescope by the eye.

A very faint star for instance does not give sufficient light for the human eye to see and the longer the observer looks the less well he sees for the eye terds to tire. Put a camera in place of the eye however at the secung end of the telescope and what do we have? In the camera is a photographic plate



The great 200-lock reflecting telescope at Mt. Palemar

covered with a sensitive emulsion which registers the presence of light however faint. During a long time-exposure the cameria eye does not become tired as a human eve would. The little point of light which represents the distant star continues to shine upon the emulsion finally making an impression and recording its presence there This point of i ght can then be studied by the attronomer at lessure when the plate is developed.

Telescopes are fitted with driving clocks which keep them turning at such speed that the same stars are always centered in the Feld of view If the telescope d d not turn to compensate for the rotation of the earth and the apparent westward motion of the stars the images of the stars would appear as streaks of light instead of points

As the telescope and the camera together form a wonderful team for recording the presence and movement of the heavenly bod ies So much for collecting light There are other extremely complicated instruments which are often used with the telescope and camera and try means fit from we fur affect to break up and analyze the light which the state of the light which will be the light which the state of the light which will be the light with the light which will be the light with the light will be the light with the light will be the light will be the light with the light will be the light will be the light with the light will be the light with the light will be the light with the light will be the light will be the light which will be the light with the light will be the light with the light will be the l

In 1666 nearly three hundred years ag Sir Isaac Newton one of the greatest physicists of all time discovered a basic fact on which most of modern astronomy and astrophysics is foun led By passing a ray of sunlight through a prism Sir Isaac found out that sunlight or white light is composed of all the colors of the rainbow In other words white light is not plain white light hut a mixture of light of different colors or differ ent wave-lengths

THE WONDERFUL SECRET OF THE SPECTRUM WHICH NEWTON FOUND BUT COOLD NOT OSE

The band of colors which we observe when we break up wh it light its know as the spec trum. Red light which has the longest wave length of any light us ble to the human eye is at one end of the spectrum and while the light which has a wave length about half as long as red is at the other end Srt Issae Newton had disconcered the key to one of the Newton had disconcered the key to one of the head to be a support of the light which had been been as the light with the light had been to use the key. An institute that the left had been the light with the light with the light had been always the light with the light had been always the light with the light with the light had been always the light with the light had been always the light with the light had been as the light with the light had been always the light had be

principle upon which it works we shall see eas ly how it fits into the astronomer's work The modern spectroscope is an instrument into which I ght enters through a very nar row slit perhaps only a few thousandths of an inch in width The light then passes through a lens known as a collimating lens which straightens out the diverging rays of light and makes them parallel These parallel rays of light from the sun or from any other hervenly body then pass through a prism which breaks up the light into the culors of which it is composed This hand of colors the spectrum is focused by an objective and then studied through a small telescope at tached to the other end of the spectroscope

troscope but if we understand the basic

The spectrograph is this same type of in strument but adapted for photographic work Other adaptations known as the epectrobelioscope and the spectrobelosgraph are used in observing the sun under special conditions. Whenever you see helio in a word you can be pretty sure that the word has something to do with the sun.

But now that we have the hand of colors spread out before us how do we use the key that 'vewton discovered' We use it to learn what the universe is made of Each chemical element in the universe

Each chemical element in the universe possesses a distinct fingerprint just as each individual person has a fingerprint different from those of every other person in the world By its distinct fingerprint an element can be recon zed whether it happens to exist in a laboratory on the earth or in the most remote star. Each chemical element is

recognized by its own distinct pattern of hines and colors in very definite places al ways the same in the spectrum. When we observe certain the post of the elements oddien. When the spectrum of sunlight or in the spectrum of a distant ista, we know that sod urn is present in the body in incanderation of the post of

In this way by recognizing the spectral hnes of any element we are able to identify the materials of which the stars are com posed or those which are present in the at mospheres of the planets We have identified in the sun more than sixty of the ninety two elements known The gas helium was discov ered on the sun twenty seven years before it was found on the earth-discovered of course through a peculiar pattern of lines which indicated in the solar spectrum the presence of an element not as yet known to man Later that same pattern of lines showed up when helium was discovered here The name belium comes from Helios the Greek name for the sun god If the star or other heavenly body which

is the source of the light being analyzed is moving away from the earth there is noticed on the spectrum a definite shift of the limit toward the red end. If the body is approaching the lines shift toward the violet end. The astronomer can tell by examining the spectrum how fast the star is moving.

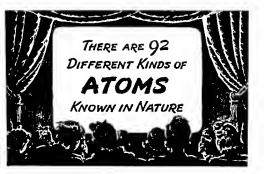
HOW WE MEASURE THE STARS AND TARE THEIR TEMPERATURE

By other instruments the interferometer and the bolometer the astronomer can estimate the airc and the temperature of star and the temperature of star But in each case the all important think is light the messenger of the universe. With our light the instruments are useful in the properties of the instrument of the messages which I plut a constantly sending to us from all read-or constantly sending to us from all read-or constantly sending to the structure of the universe and of our own comparative loneliness in space. We have constantly all the sending the

comparative loneliness in space. We have learned too how small and unimportant our eartily home is.

One thing not even our most del cate in struments can tell us as yet. Are there other planets other solar systems perhaps with living he ngs? I ossibly some day we shall have instruments that will tell us definitely

ses or no



ATOMS AND ATOMIC ENERGY

By Thomas H Osgood

WHEN the first warm days of summer come, we all enjoy seeing flowers and vegetables growing in our gardens and fields They grow so fast that the difference in size can be noticed almost from day to day. They all started from tiny seeds so we naturally believe that most of the stuff in the fruits and leaves must have come out of the ground, or out of the air, or out of the ram. or out of the fertilizer which was used Later on we eat the vegetables-the tomatoes, the carrots, the corn and the beans By eating these and other things children grow heavier and taller, their bones grow stronger their hair grows longer. So we must also befieve that most of the stuff of which children and adults, are made must have been contained in the food they ate, or in the air they breathed, or in the water they drank If you think about this a little you will want to ask Are there the same ingredients in the soif, in the vegetables and in ourselves? Men have sought the answer to this ques

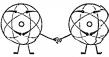
tion for centuries. They have learned how to take the carrot to pieces, and the soil also Annuncement has lately been made of the finding of additional atoms. These pages tell of man made atoms

and wood and coal and sugar and salt and all other kinds of matter that we see around us They have found out what we are made of, also

Yes, it is true that you will find some of the same ingredients in the soil the air, the rain, the carrots and other vegetables and oursefves Now here is a very wonderful thing Cut a carrot up, and keep cutting until you have the smallest possible piece of car rot, and you have a tiny, tiny piece of mat ter You have such a tiny piece of matter that you can not see it--you can not see it with any microscope, though you might see an enlarged image of it by the wonderful electron microscope

He call this timy piece of anything a male cule, which means 'small piece' Now a molecule stself, though it is so tiny, is made up of even timer parts. In most cases, how ever, the parts are not the same as the mat ter we started with The parts of a carrot

molecule are not carrot, for instance These parts that combine to form mole cules are called atoms. The molecules of some things (water, for instance) have just two kinds of atoms locked together Other materials have many different kinds of atoms Some molecules are rather simple, others are complex, with hundreds of atoms of various kinds, combined according to rules of nature We have not yet discovered all



How some stome join tagather to farm a melacule Each Individuel of this triba presented only one arm

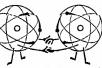
these rules, but we know some of them New molecules are continually heing dis-

covered by chemists to add to the thousands we already know But in all the world-and in the sun the moon and the stars-there are only ninety two different kinds of atoms As you know man has lately learned how to do very wonderful things with the atoms, changing some of them at will But it is still true that in nature there are just ninety two different kinds of atoms it is the way in which these atoms form into groups that make the great wide, varied world we see, and everything in it

You can understand this if you think of a piano There are only eight; eight beys, yet their sounds can be combined in count

less tunes Now let us consider the ninety two different kinds of atoms Some are very familiar to us Every day we see materials made of contains atoms of only one kind, and therefore one of them is called an iron atom. The atoms of mercury in your mother's fever thermometer are all of one kind, they are mercury atoms Silver, gold and lead are each made of only one kind of atom, though we often mix them with other materials to make them stronger metals, called alloys, for dash use

Il hen a substance is made up of atoms of one kind only it is called a chemical element Familiar chemical elements are iron, copper



Other stame combine to form molecules by "double bond" or this voice to called Each individual of this tribe personnes two arms

and aluminum which are metals oxygen, hydrogen and helium, which are gases car bon, sulphur and phosphorus which are sol ids but not metals, mercury is a liquid Some chemical elements can be told by their appearance, although appearance alone is not reliable as a final test Copper is reddish aluminum is greyish, sulphur is yellow, car bon is sometimes black sometimes colorless These special colors of some of the chemical elements must not however be thought of 85 the colors of the individual atoms of which they are composed The particular reddish color of a chunk of copper 15 not due to any color of the individual copper atoms, but is



If you were making a cardboard village you sold arrange the buildings as you liked in order of value perhaps Column 3, on the next page, arranges the atoms seconding to weight, youting hydrages, the lightest, in first place

caused by the special way in which the atoms are put together to make the solid piece

As we have said there are only unity two known different kinds of atoms, or chemical elements. Every but of matter in the world is made up of some combination of these nunety two Athough we say that they are all different, nevertheless some show a sort of family relationship. To understand this tunk first of the buildings in a vallage. They could be listed in order of size starting at

the smallest and ending with the largest \(\lambda\) number could be assigned to each starting with \(x\) for the smallest and going on until all the buildings were numbered

Another number could also be put oppo sate each building on the list representing let us say the value of the building Usually but not always I be value would be greeter the larger the building And finally some de scriptive term could be added to each entry on the list such as grazae shop or dwelling

TABLE I THE ELEMENTS

~345

Column 1	Name of elem	ant.			Column 4 A	poter mate	atomia	n a abs		
Column 2 Chemical symbol					Column 4 Approx mate atomic we ght Column 5 Form when pure					
or al breviation						gas Vi m		hound		
Column 3	Momic numb				•	non meta	1 121	ı us		
Hydrogen	ff	1		G	Silver	Ag	47	108	м	
Helium	Ϊle	•	4	Ğ	Cadmium	Câ	48	112	ű	
Lithium	Lı	3	ż	м	Indium	In	40	115	M	
Beryllium	He	4	ó	м	Tin	Sn	50	110	M	
Boron	В		rí .	× .	Antimony	55	51	122	1	
Carbon	ç	5	12	١.	Tellurium	Te	52	229	į.	
Mtrogen	Š	Ž	14	Ğ	Iod ne	1	53	127	· ·	
Oxygen	0	4	16	Ğ	\enon	\e.	54	131	Ġ	
Fluorine	F	9	10	G	Cesium	(s	53	133	M	
\en	Ne	10	20	Ğ	Barrum	Ba	56	137	M	
Sodium	Na.	11	23	M	Lanthanum	ž a	57	1.10	11	
Magnesium	Mg	12	31	M	Cenum	(.e	59	149	M	
Aluminum	N ²	1.3	27	15	Prascodymuum	Pr.	59	141	M	
histon	٩	14	28	١.	Neodymium	~a	60	144	1/	
I hosphorus	r	15	31	N	III num	11	61	7	M	
Sulphus	S	16	31	N	Samartum	٩m	Ď2	150	- 11	
Chionne	Ci Ci	17	35	Ġ	Furopeum	Fu	63	152	M	
Argon	Ä.	18	40	G	Cadolinium	€ 4	04	157	11	
Lotassium	k.	10	30	М	Terbium	Tb	65	159	M	
Calcium	Ca	20	40	M	Dysprosium	Dy	66	162	M	
Scandium	8	21	45	M	Holmum	fto	67	164	M	
7 stanium	11	22	49	M	ł rbium	Γr	63	158	M	
'anad um	<u>V</u>	23	51	M	Thui um	Tm	60	150	M	
Chromlum	Cr	24	57	M	tteri rum	1,9	70	173	M	
Manganese	Mn	25	55	M M	Lutectum	I u	71	175	N.	
fron) te	26	50	Ni.	Hafmum	74	72	179	31	
Cobalt	Co	27	59	v	Tantalum	114	73	181	ii.	
Nickel	N 1	28	50	Ni.	Tungsten Rhemum	Re	74	184	ii.	
Copper	Cu 7n	29	64	M	Chanium	Ĉ.	75	192	ii	
Zine	C.	30	65	ŝ	Indum	fr.	-7	101	ŠÍ.	
Galhum	Ce	31	23	νi.	1 latinum	i'r	78	103	ü	
Cermanium	Às	33	73	v.	Goll	Âu	79	197	vi	
Arsenic	<i>₹</i> °	34	79	i	Mercury	He	ño	201	WI	
Bromine	Ř.	35	50	ŇL.	Thallsum	iï	8i	201	M	
krypton	N.	36	84	G	1 cad	Th	82	207	31	
Rubidium	Rb	37	85	36	Bramnth	Bi	81	200	M	
Strontium	\$r	34	88	M	Polonium	fu	84	210	31	
Hitium	i i	10	8g	vi			85			
Arronium	Ž,	40	QI	V	Radon	Rn	F.o	222	G	
Cotumt turn	Cb	41	03	31			8-			
Violy belenum		41	96	V	Radium	Ra	85	236	M	
Masurium	Ma	43	7	M	Acttnium	Λe	89	27	M	
Ruthenium	Ru	44	101	\1	Thornum	Th	90	2 3 2	31	
Rhod um	Rh	45	205	31	Proto-actinium	F2	91	331	M	
Padadium	14	40	10*	*1	Cranium	ι	92	274	31	

It would be a strange village if every eighth building were a garage with a church next, ther

When atoms are listed in this way Table I is obtained The first column of Table I tells the name of the atom hydrogen, or m trogen, or another The next column gives the usual abbreviation of the name, or its chemical symbol often the first two letters of its name in Latin Then follows a number, called the atomic number which ranks the atom in order of size, or weight Next the atomic weight of the atom is given, counting hydrogen as having weight r And finally a letter is given to tell whether the atom ordi narrly joins with other identical atoms to form a metal, a non metal, a gas, or a liquid Thus we read Copper, Cu 29, 64, 11-which tells that the chemical symbol for copper is Cu that it is 20th from being the lightest atom that a copper atom is 64 times as heavy as a hydrogen atom and that the material copper is a metal under ordinary con ditions So we see that the table gives a good picture of each element

We would think it a very strange village if every eighth building in the list starting with No 2 was a garage and every eighth building starting with No 3 was a drugstore, and every eighth

building starting with No 4 was a residence, and every eighth building starting with No 5 was a bakery Yet this is just the kind of thing we find in the table of the various elements

When applied to atoms and chemical elements, this strange regular ity is known as the periodic law To make the meaning clearer, some of the atoms from Table I have been set down in crossed col umns to Table II, which is part of the Peri odic Table used by chemists Reading the atomic numbers across, you

have 2, 3, 4, 5 6, 7, 8, 9, 10, 11, 12, 13, 14 15, 16 17, 18, 10, 20, 21, 22, then some jumps then 33 to 40, then more jumps, then 51 to 56

The atomic numbers remember, tell the way the elements rank in weight, beginning with the lightest, hydrogen

Now read down, beginning with 2, Helium 2 10-18, 3 11 19 4 12 20, 5 13 21, 6 14 22 7 15 8 16 9 17

The pattern is not perfect, but again and again you see the atomic groupings themselves, eight atomic numbers apart Is this just a matter of chance? No The

atoms in the columns really are related Numbers 4, 12, 20, 38 and 56 (beryllium, magnesium, calcium, strontium and bari um) which fall into the same column have very similar properties. They are all metals, they look somewhat alike and they behave very much alike, so much so that chemists often have diffi

wi

culty in telling from their be

havior which is which

Again as a result of this grouping by eights, five elements, helium, neon, argon, krypton and xenon find them selves in one column These elements are all gases their chemical behav ior is identical, in

that they will not

TABLE II PERIODIC TABLE 0 11

Relium	3L1	4Be	213	6C	1/1	80	9F
10 Ye Neon	11/2	rz¥fg	1341	1451	428	165	17C1
15 A Argon	19K	20Ca	21°C	22T)			
					33 45	34Se	35Br

37Rb 39Sr 18Y 40Za Krypton srSb saTe sal

4/2 55Cs x6Ba Lenon



a house then a beak, then a school and so an The elements do show this cort of arrangement.

enter into chemical combination with any other elements. Thus they are called inert, or noble, gases, because they stand about It is thus noblity which makes behum so valuable for aurships and blimps. It can not combine with oxygen or with any other element to make an explosion.

A story of relationship can be told about the elements in any other column of this Pe riodic Table Similar elements fall into the same column, but elements in one column say IV, are quite different from those in, say

VÍI

Let us go back for a moment to Table I You will notice that spaces 85 and 87 are empty These must be left unfilled for ele ments which have not yet been discored bke seats in a theater for which tickets have been sold, but which are not yet occupied No other element has any right to be put there.

The whole study of chemistry, part of the study of physics and some of astronomy are based on what you have just learned about these ninety two elements. The next step is to see how they combine to form molecular, and so build up the other materials in our

world
Atoms do not combine helter-skelter, but

according to strict rules, beautiful rules of harmony. We spoke earlier of the eighteight piano keys. You can not make chords just by striking any notes together. You must learn the rules. You must learn what notes can be sounded together to make beautiful new sound patterns.

It is the same with combinations of atoms Some, as we have said, will not combine at all Those we call the noble, or mert gases Different atoms do not always combine one and one, but sometimes one and two or one and three, or two and three. This orderly and regular behavior is governed by a number called valence Different atoms have valence o. 1. 2. 3 or 4 You would not be far wrong in thinking of an atom as having hooks by which it could attach itself to other atoms There is one strict rule, however Every hook must be used The number of hooks is the valence of the atom. The noble gases have valence o They do not combine with other atoms Magnesium has valence 2, chlorine 1 Therefore one atom of magnesium hooks on to 2 atoms of chloring, leaving no hooks un used The compound is magnesium chloride, written MgCl.

Oxygen, however, also has valence 2, 30 one atom of magnesium can combine with one of oxygen, each atom using its two hooks like two children each holding both the other's hands. The compound is mag

nesium oxide, written MgO

Turning once more to the Periodic Table we see that the atoms are classified also are cording to valence. In column I all the elements have valence I in column II, the valence is 2. Other valence numbers are column II, 3, column IV, 4, column V, 3 column V, 3, column V, 1, and of course column O, o Thus by looking at the Periodic Table cartefully, one can predict how











The noble gases so they are called, will set combine with other elements, but stay aloof. Relium goon, argun trypies god renon occ noble gases. Relium, the lightest of them, is the best gas to use in hallooms. ~5°/62~

different atoms will combine if they com bine at all For example Ca(2) and F(2) make calcium fluoride Cal, Na(1) and Cl(1) make sodium chloride NaCl which is the chemical name for common salt

A brick wall is made of bricks so is a pile of bricks dumped from a truck. The one is much neater and better looking than the other. This difference in appearance depends on how the bricks are put together to make the wall or to make the rough pile. There are several kinds of atoms which can be put to gether in different ways for example carbon and selen um to take only two which are marked with V (for various) in Table I Car bon atoms to ned in one way make dia

monds in another way, they make graphite Both these substances are pure carbon but the atoms are put together in different ways Diamond is very hard, graphite is very soft

Selemum can be made when pure, in three forms (a) red crystals, (b) red but not crystalline and (c) gray metallic crystals Only the third variety conducts electricity at all well Different forms of pure chemical elements such as these are called allotropic modifications, or allotropes Not all elements which occur in different allotropic forms are so indicated in Table I Many elements are so rare that they can not be obtained pure enough or in sufficient quantity to provide material for experiments

LOOKING INSIDE THE ATOM



We have seen that the smallest possible piece of table salt a molecule of salt is made up of two even smaller bits of matter an atom of sodium (Na) and an atom of chlorine (Cl) We write the combination

NaCl Sodium is a metal Chlorine is a gas. Their atoms combine to form the gritty salt we use every day

How do they do it? Before we try to learn the answer to that question let us find out what an atom is

The word atom means uncuttable Some scientists of olden days thought an atom

could not be cut They thought it was a tiny tiny tiny bit of matter the smallest possible bit and that the bits were all alike in any one substance

But we know now that an atom small as it is really is made up of still smaller par ticles of matter and there are several differ ent kinds of particles. They are not thrown together helter skelter but arranged in a beautiful pattern Inside the atom there is constant change and motion

So now let us look into an atom of bydro gen It is the lightest element and a single hydrogen atom is the simplest kind of atom In the center is a mass of substance called a nucleus Near it but not always in the same position is a much smaller bit of mat ter called an electron. The mass that makes the hydrogen atom s nucleus is called a pro-

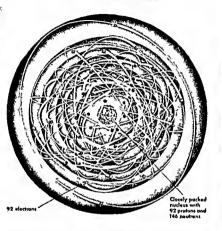
You know that there are two kinds of elec tricity which have the names positive and negative Now the proton of the hydrogen atom carries (or is charged with) positive electricity The electron carries negative electricity The proton is about 1 850 times as heavy as the electron but their electric charges are equal and opposite

Since the electric charges are equal and opposite, the atom as a whole has no electric charge - 1 + 1 = 0 This is true of every atom-its electrons are balanced in positive and negative electric charge

Now let us look into an atom of the next element helium with atomic number 2 We see a nucleus and 2 electrons. In the nucleus are 2 protons, which balance the electrons and the nucleus also has 2 other particles of about the mass of protons yet without any electric charge They are neutrons The mass of the electrons is so small as to be insignifi cant It is the nucleus by which we tell an

URANIUM (192)

the heaviest atom known in nature



No see, aver any as size. Not green his most prescrib microscope over mote centil bring within any sight the integral and benefit also have that or marine illustrative the same and the central influence of a single straining attention to the same and t

How the POTASSIUM atom (19) might fook
If we could view it through a microscope
Outsimost shell with one
lane electron, though



Now the SODIUM atom [11] might look if we could view it through a microscope



atom's weight. We see by the table on page 45 that helium weighs four times as much as hydrogen—now we know why. Hydrogen has 1 proton, helium has 2 protons and 2 neutrons.

neutrons.
How about isthum the third element? A lithum atom has 3 electre as round shout the mackets in the neutre or the markets in the neutre of the markets in the neutre of the day a neutron. The time is electric charge and a neutron The time is the histogen atom and when we look at our talke page 36, we see this accorrect. The atomic weight is 7 look at the table once more Column and the page 16, and the table once more continued in the page 16, and the table once more column anniher is really the number of electrons (or number is really number of electrons (or number of electrons (or number is really number of electrons (or number of electrons (or number of electrons (or number of

Down at the bottom of the list uranium the heaviest atom, has atomic number 92. Its weight 15.28, therefore you can figure for yourself the number of neutrons—146

John Luce Butther of neutrons—140

The man and the man and the season of electrons near the season of electrons near the season of the ple has \$2. As a result, the nucleus x x vry well protected from outside meterience \$11

vou lived in a bouse surrounded with \$3.

Tarific lanes, and your french shad to dodge carried to the season of th

In an atom the first lane nearest the nucleus, has room for only 2 electrons at any time. The lane outside the first has room for 8, the one after that, 8 the next one 18, and so on until all the electrons are accounted for I or example potassium, with 19 electrons has them circling 2 in the first lane 8 in the second 8 in the third, and only 1 in the fourth although there is room in the fourth lane for 17 more

These traffic lanes or electron shells are not all equally spaced around the nucleus in the way that rings on a shooting target often are The actual distances do not mat ter very much to us, but it is important to know that the shell nearest to the nucleus is very close to it, and that the outermost shell which has only one electrin in the case of potassium is very niuch farther out than any of the other shells het in spite of all this complex structure, the diameter of the potassium slom, which means the diameter of the outermost electron shell, is only about one hundred nullionth of an inch 11 now we imagine that we have special microscopes and take a quick look at a potassium atom we would naturally see the most prominent part of a first, which would be the compara tively large shell in which the lone outermost electron was revolving We would notice some sort of tiny structures at the center of this shell but would probably not pay much attention to the details Actually it would contain the nucleus and the inner shells of electrons

If we took, a quick glance at a sodum atom, we would notice one electron moving in the outermost shell, and, far inside the nucleus and two other truy shells. The potassism and sodium atoms both have one very large shell for the single outermost electron, and a central nucleus with other small shells of electrons round it. The chemical nature of electrons round it. The chemical nature of material properties of the shell are offented. It is small should be shell are offented it is shell wonder, then, that sodium and polassoum for similar chemical elements and are therefore

put along with hydrogen in the first column of the Periodic Table where the valence is I (page 46)

The same sort of explanation can be given for atoms in other columns of the Periodic Table The noble gases in column O are a rather special case. In all these atomshelium noon argon etc-the outermost traffic lane or electron shell is full There is no room for any more electrons. And when the shell is full it is just as though the atom



built up a wall round itself and would have nothing to do with its neighbors. That is why the noble gases stand aloof and do not com hine chemically with any other atoms

The argon atom is like hellum a

Let us take a look at magnessum The table of atoms tells that it is the twelfth I ghtest atom, and therefore has 12 electrons cirching round its nucleus. These are arranged in two full shells containing 2 and 8 electrons respectively with the remaining 2 electrons in a very wide shell The nucleus must have a positive charge of 12 and therefore con tains 12 protons The atomic weight 13 24 so there should also be 12 neutrons in the nucleus It has been found however that the mass

of the nucleus is not nearly so important as its charge. The nucleus of magnesium must bave a charge of 12 but it need not have a mass of 24 Suppose another neutron or even 2 were added to the nucleus The charge of the nucleus would still be right for

Two MAGNESIUM atoms (*12)





Megaesinm with a temic we ght 24 ueu ally hes 12 protone 12 neutrons

magneslum la tape which has I protone and 13 neu rons to Its aucleus

magnesium and the outside electrons could be arranged just as before Actually some magnesium atoms have nuclei constructed in this way giving them masses of 25 and 26 but keeping the positive charge at 12 Such alternative atoms are called isotopes

A piece of ordinary magnesium metal al ways has about 78 per cent of atoms with mass 24 II per cent with mass 25 and the other II per cent with mass 26 We do not know exactly what determines these percent ages These isotopes are perfectly good mag nesium atoms Chemical tests can not tell them apart an instrument called a mass spectrograph is needed

You might think that a great number of other isotopes of magnesium might exist. But they do not There is actually one other of mass 27 (12 protons 15 neutrons) hut no sooner do physicists put it together than it falls apart again. It is unstable or rad oac tive Why so few stable isotopes exist we really do not know. When we have found out more about protons and neutrons we may be able to answer the question

Most elements consist of several isotopes There is even a kind of hydrogen atom with mass 2 called heavy hydrogen but it is very rare. Tin has as many isotopes as any ele ment It has so all of course of atom c number so and ranging in atomic weight from 112 to 124

Uranium has several isotopes. The most famous is uranium 235 Men have found how to split uranium 235 in two and through

this operation they learned to make the fear ful atomic bomb. We tell you more about this on page 53 under Atomic Energy We now have a picture of a typical atom -a nucleus surrounded by shells of elec-

trons with the electrons circling continu ously All but the outermost shell have their



full share of electrons. However once m a while this beautiful regular arrangement is disturbed. If some outside influence such as a fere rowing electron comes along it may knock one of the outermost electrons of the atom slightly out of its regular orbon to traffic lane. The free rowing electron will get quickly out of the way like a hat and run automobile driver. The atom will be left a bittle different from normal However very soon the electron which has been slightly displaced will jump back to its former place.

When this happens the atom gives out light. The light from one atom would be far too faint for our eyes to see but when mil lions of atoms behave in the same way at the same time the light can be very bright. This is exactly what bappens in a neon sign Roying electrons sent by electricity scurry through the neon gas in the tube and disturb numbers of atoms. When these atoms return to normal which they do in a small fraction of a second the familiar red light is given oul Because all the atoms are of the same kind and behaving in about the same way the neon light is the same color-red Every kind of atom gives out its own special kinds of light forming what is known as its *pec trum In this way atoms can be identified by

their light In the above paragraph we have learned how an atom gives out light while returning to its normal condition after one of its outer most electrons has been all ghtly disarranged by some gentle disturbance. However an atom may be disturbed very violently for example by electrons moving at extremely high speeds. Such high speed electrons occur naturally as a consequence of the cosmic rays which beat upon the earth from ouler space They can also be produced artificially An \ ray tube sends a stream of electrons moving at speeds between 50 000 and 180 000 miles per second When one of these electrons strikes an atom (for example in the metal target in the \ ray tube) it is likely to dislodge an electron from the atom and will

most likely dislodge it not from the outer shell but from one of the innermost shells Now these shells are known by special

~3²5~_

names. The one nearest the nucleus is called the K shell, the next one the L shell, the next the M suppose one electron has been knocked out of the K shell. The disturbance has been so violent that the electron is likely to be removed entirely from the neighbor boad of the atom What is left is of course an ordunary atom with one electron missing from the K shell.

This absence of one electron gives the atom considered as a whole a positive charge of electricity. The atom can not remain long in this incomplete condition any more than a good householder will allow a broken window to go unreparted for a long time so the atom proceeds to readjust its the best of the statement of the statemen

When these electron jumps occur the atom grees out \ \text{Tays} which are really a kind of light only with a very much shorter wave-length than ordinary light. Thus we see that the formation of that kind of light which we call. \text{V} rays is not very much different from the production of visible light as we described it in the case of the neon sign. \text{V} rays occur when an electron makes a jump \text{V} rays occur when an electron or when an electron electron with light is given out when an electron makes a very small jump in the outermost when an electron with \text{V} rays of \text{V}

But we have left the atom after rearrang ing its electrons in an incomplete state with one electron missing from its outermost shell. How does it acquire an electron lo complete its structure again? At all times there are always free electrons dritting around in a metal and even a few in the air. The atom samply picks up to the propose of the electron dritting around an extension of the electron dritting around and existence just as the good householder who has the broken window remarks.

ENERGY FROM ATOMS

By Gerald Holton

Y OU have learned that all matter is made up of tiny particles called molecules. A rod of iron for instance is composed of iron molecules just as truly as a brick wall is built up with individual bricks. And you have learned that each separate molecule is com

posed of one or more atoms of which there exist in nature only ninet; two separate kinds On page 45 is a list of all these differ ent atoms starting with the lightest hydrogen and ending with uranium the heaviest and biggest. If a substance is made up of atoms of only one kind we call it an element. Let us look once more at the I ghtest element, bytingen Each of its atoms consists ofton of fleent particles one is the relatively heavy proton, which is positively charged and sat the center of the atom and the other particle is the tiny and negatively charged and is at the center of the atom and the proton. The center of the atom and the proton. The center of the atom and the proton. The center of the atom is called the nucleus.

Helum the next heavest atom is made of three different particles. At the center the nucleus, there are two protons and two other three four are two electrons and circling around three four are two electrons. The neutrons are about as heavy as the protons but have no electric charge.

The th rd listed atom has 3 electrons and 3 protons the fourth element has 4 electrons and 4 protons and so on down the list until we get to the last element uranium which has 92 electrons circulating around a nucleus that contains 92 protons and ra6 neutrons

NATURE ALWAYS MIXES THE ISOTOPES OF AN ELEMENT IN THE SAME PROPORTION

Thus we find in general that each separate matteral atom bas as many (required) charged) electrons outside the inclores as there are (posticity) charged) protons in side. The number of neutrons in the nucleus as not so fred for instance not all uranum atoms have 146 neutrons some have only 142 yillers only 142. Thus see find in nature (ag others only 142. Thus see find in nature first is much more abundant than the other two.

Now there are two remarkable facts about isotopes. The first is that nature always mixes the isotopes of an element in the same proportions If you took an ounce of ordi nary uran um ore from anywhere in the world you would find that most of it con sists of atoms with a nucleus of 146 neutrons and 92 protons thus having 238 umts of weight since protons and neutrons weigh the same and since the electrons outs de the nucleus are so I ght as to be almost neels g ble We call this kind of urannim II 228 But mixed with the U 238 in a lump of natu ral uranium are some of the isotopes weigh ing 235 and 234 units (one has three new trons less than U 238 the other has four neutrons less) The Esotopes are always mixed in these proportions 99 3 per cent of U 238 0 7 per cent of U 235 and about 0 006 per cent of U 234 These isotopes of the same element are difficult to separate

from each other in the laboratory because

they are all nike in their chemical activities Another miteristing property of isotopes of arous elements is that their nuclea are not caully stable. In some stoopes when left all to themselves the atoms by and by all fall apart emitting (shooting out) some of their particles at great speed Such isotopes are called radiacative Others do not readly it's mitegrate (fall apart) by themselves but are easily however, or own the outside. You can learn about these mitegrates are learn about these mitegrates in the chanter on Radiacativity.

Whenever an atom disintegrates into smaller pieces some of the matter of which the micleus consists disappears completely and is converted into pine energy. The amount of energy resulting from south of the pine of the pine

This method of creating atomic energy by destroying matter in an atomic nucleus of i fers radically from the usual process of the taning heat energy by burning or combustion which insolves only a rearrangement of whole atoms and their electrons with respect to each other.

We can now make a picture of the production of actions centry. A lump of matter say transium consists of transium atoms of three kinds namely U-38 U-33, and U-34. There suche cours st of 19 protons plus right that the contract of the cont

THE WAY TO SMASH THE NUCLEUS ITSELF

Let us shoot into this cloud of atoms a very small particle say a proton it is about 1850 times heavier than an electron and like the nuclei of the atoms themselves it is charged positively and as you know postive charges repel other positive charges

Therefore this proton will be repelled from any nuclei it may approach, and be turned aside, perhaps knocking a few electrons out of their regular path, as it goes by, until it has exhausted all its energy and is slowed down. Hardly, ever will the proton have a chance to collide with a nucleus.

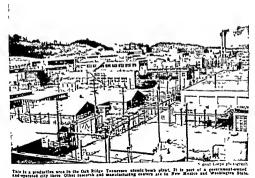
But if, instead of a charged preton, we fire an uncharged neutron into the atomic cloud, it is not repelled by a wicleus that may be in its path, and a "head-on" collision is possible. While, therefore protons and other charged particles can knock only chips off the "surface" of an atom, the neutron can get right inside and knock the nucleus itself apart. This is called fission.

This is the secret of atomic energy A neutron shot into a nucleus can smass the atom so that part of its mass is converted mito pure energy and the remander forms new atoms If a neutron having a httle energy is affed into a lump that is mostly U-325, the following amazing thing happens. The first first happens have been also followed the first fir

form another lighter atom Several neutrons that were locked in the old U.35 nucleus have no place in these nuclei of the new atoms, they are free to shoot through the rest of the atom cloud around them. They do so as very great speed because during its ston about one tenth of one per cent of the atom cloud lawning atom has been converted into pure energy which shows up in the great speed of these thing has the shoot one tenth of the present of the several speed of these thing has been converted into pure energy which shows up in the great speed of these thing nativeles.

This explosion would not be noticeable by us if only one atom were set off But you can see readily that the several neutrons that if around after fission of their mother atom may similarly set off other explosions all around them, this "chain reaction actually occurs in a lump of U 25 as used in one kind of the atomic norm. Within an intended the atomic norm. Within an intended the atomic norm. Within an intended the total members of the surface of the surface in the surface of the surface in the

As far as we know now, this powerful "chain reaction" occurs only in U 235 and



i-operated city there. Other research and menancin





I spar ment at M nos a d Kasources pilo ograph An expected pholographic plate shows veins at pitch bloods (beltem) which can in natural reck (lop)

in one other element called plutonium which has to be produced artificially. This is the way plutonium is made. Ordinary uranium ore, as found in certain portions of the United States northern. Canada Carchine States in the Canada Cana

Actually the fire would go out altogether if two treks were not used. One is to meer in the treks were not used. One is to meer within the pile some material like graphite blocks. Their function is to slow down the neutrons from the U 335 fission. Why slow with them down? Well it is a curious fact them these slowed-down neutrons are more effective in breaking up muclei than use the

high speed neutrons produced by fission. The other trick used to keep the chain reaction going in the pile is to build it so large that only relatively few neutrons from the made can reach the edge of the pile and escape without having hit and produced fission in some other atoms of U 235 or at least having hit and become absorbed by some atoms of U 238. That is called the critical size of the pile. In a pile below critical size so large a portion of the neutrons escape into the air neferor exting

that the atomic fire will go out

In such a pile kept well supplied with fast flying neutrons by the chain reaction of the U vis asotope the U vi8 atoms may capture neutrons without their nuclei fall ing apart. But then a curious thing happens to such a U 218 atom. The captured neutron which makes the atom now weigh 230 units by and by seems to split inside the nucleus into a proton and an electron The tiny elec tron is violently pushed out of the nucleus But now the nucleus has 93 protons instead of the usual 92 of uranium Not long after that the same thing happens again in the nucleus (as tho igh one tickle made the atom sneeze twice)-another neutron in the atom splits into a proton and an electron and the electron flies out leaving 94 protons and 145 neutrons in the nucleus. This atom can of course no longer be considered uranium it is called plutonium It happens to act very similarly to U 235 If it is separated from the other materials in the pile that produces it and assembled into an atomic bomb like L 235 it too explodes with terrific violence by a chain reaction which spreads through the whole bomb material instantaneously

PLUTONIUM CAN BE REPARATED AND CONCEST TRATED MUCH MORE EASILY THAN U-215

You may wonder why anyone went to all the bother of producing plutonium (written as Pu 239) for atomic explosions when it can do no more than the natural U 235 can do The answer is twofold First it is very diffi cult to separate the isotope U 235 from U 238 since they are chemically alike hut plutonium is an element chemically different from uranium and can therefore be separated and concentrated with greater case And secondly as we have noticed before the amount of the U 235 isotope in a lump of natural uranium ore is very small compared to the amount of U 238 So it is more economical to convert the U 238 into plutonium than to extract the rare U 235 and discard the 140 times more abundant 1sotope U 238

Just as a pile for making plutonium will not begin to work until it has been built up to a critical mass or bigger so too a bomb made of U 23,50 r plutonium will not explode if its mass is below a critical size. This fact suggested an ingenious way of detonating (setting off) the bomb namely, by suddenlyoning small pieces of the explosive material (U 235 or Pu 239) each below the critical size but more than sufficient in size when put together to spread the destructive chain reaction through the whole bomb For U 235 this critical size is probably a lump of less than 200 pounds mass.

Are there any uses for atomic energy be sides the destructive ones? Luckily the an swer is yes. Famous scientists have predicted that not many years after man's first use of atomic energy in the form of bombs we shall have atomic power plants and atomic.

engines

At first we m ght just make use of the enormous quantite so fi heat that are liber ated in the uranium and graphite pile during production of plutonium Actually about one million kilowatts of power can be expected from one such pile which is not far from the amount of power developed by a large size electric power plant Of course some kind of heat engine would be used to transform the heat energy in the pile to the control of the plant of the course of the plant of the course of the plant of th

ful work

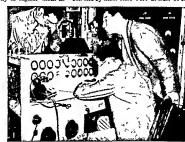
Later on perhaps in fifty years ways may
be found to use atom c energy liberated in a
chain reaction directly in engines much as

gasaline fuel is now being used in combus ton engines. But before this can become possible a great deal of progress in physics and engineering will have to be made. But there are other more immediate results of the research on atomic energy. We have learned a great deal about the nucleus and its be havior which may open up new and better ways of using ordinary power generation. Vluch has been discovered about new radio active materials and their effects in human bodies and in chemical reactions this bene fits greatly the fields of medicine biology, and chemistry.

What about the supply of fuel for atomic energy? Vasts we depend on ura num? We know that fission of single atoms can occur in several different elements but the production of larger quantities of atomic energy depends on a self maniamed chom reaction of the material used as fuel and so far only uranium and tranum produced so far only uranium and uranium produced bet the known deposits of uran um could supply the fartal world nexts of power for

only a few scores of years!

Therefore we shall have to find other ways of generating atomic energy—for instance to try to induce chain reactions in more plentiful and available elements such as some of the metals Actually it is just such a process involving the nuclear interaction of carbon hydrogen in trogen and only pen which produces the enormous energies radiated by our sum and by other stars. Part at least of the



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Tate p cture was made these minutes of or an etemic bamb hit the Japanesa tity of Regeseki on August 8. The huge smalls column towe of more than 20,000 feet in the ar On the ground the hint reduced the city to dest.

beat in the interior of the earth which prevents its cooling and complete freezing over is also thought to be atomic energy liberated by rad oactive elements

A third process in nature involving the kind of atomic fire that results from the de struction of nuclei is the spectacular explosion of stars which happens now and then A whole star seems to become suddenly a big

atomic bomb and vaporizes part of its mass suddenly into I ght and heat

It may have been such a celestial explosion which guided the shepherds to the crib of the Prince of Peace the child Jesus in Bethlehem May we all succeed in making this new powerful tool of producing atoms energy a means of spreading peace and

plenty to all men

AUSTRALIA

By Lloyd Clarke

DY far the most Important event in the Australian calendar of 1948 was the toming of peace to the Facilic. And in Australia as in other countries, men and women turned their thoughts and their energies to the task of building a new pattern of living after almost six years of little war.

The year had seen rapid changes and advances for the Australians who were fighting the Japanese. The new year first torought news of a new Australian offensive Its purpose was to clear out the 102,000 Japanese trapped in strongly defended peckets in the stapped in 102,000 Japanese trapped in 102,000 Japanese Japanese

ton, in the Philipmer. The hy passed Japa new trops were no services threat in the Allies. Less of communication used to the Allies. Less of communication which is the external proof resonantly they had a see external communication of the communication of the character Australia (elt also that she had an obligation to clear the Japanese mon lands which rightly belonged to a friendly nature tropic.

Consequently, the year began with four crack divisions of Australian troops regard in a new campusen which I rought I shring as bitter as any hey had yet encountried. In many III interned people this strongle that was wared for right weary months left exact brought an end to havilit they was jumple waiting them self-my end to have the self-my end to the strongle that was a superior of the self-my end to be self-my end to be self-my end to be self-my end to the self



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Australians are famous fighters. A mortar crew in action with the enemy at close range Ballkpopen Bornes

tropic jurgle so perfectly suted to defense the battle to clear out the Japanese remnant became a costly inner war —a war inside the ever widering circle that marked our progress toward the final goal—Tokyo In New Gumen New Brittain and the Sodomous enemy casualises for the eight mooths were them in derech band to hand clashes in who the hastralium lost one soldier to every four teen Japanese.

Austral a s part in the war to defeat Japan. was not limited to fighting the inner war Australian armen and sailors were in the forefront of the Battle for the Phil ppines On May 1 came news that battle-seasoned Australian troops had stormed ashore on the oil rich island of Tarakan off the coast of northeast Borneo This sudden and unex pected thrust drove right at the heart of Ja pan's criminally gained empire of conquest This attack was quickly followed by an invasion of the Borneo mainland From the east and the west Australian soldiers hemmed in the enemy and caused him to flee to the north to the south and to the inland hills where Royal Austral an Air Force bombers and fighters strafed him mercilessly Al though the Japanese fought stubbornly in Borneo the fiery fanaticism that had marked

their earlier campa gns was dying A few

neeks before the Japanese surrendered the Australian commander Lieutenant General Sir Leske Norchead was able to announce that all the first objectives of the Borneo campaign had been secured. While men were ficting setting the stage

While men were fighting setting the stage for the final defeat of Japan other men at San Francisco were setting the stage for peace. Australia was represented among the hity nations which met there in conference to draw up the security charter Australia's delegation was led by Deputy Prime Minister Francis Forde and External Affairs Vin ister Dr Herbert V Evatt They made two important contributions to the debate. The first was their leadership of a bitter opposi tion to the veto powers which the United States Britain Russia China and France sought to impose So ably was the Australian case presented by Doctor Evatt that he became known as the leader of the I ttle 45 as distinct from the well known Big Five the powerful countries which might other wise have unduly swaved proceedings. Aus tral as second contribution one which was finally adopted concerned the embodiment m the charter of the principles of full em playment Long before the San Francisco Conference the Australian Government had committed itself to a policy of full employ ment This proposes simply that each na

tion should take upon its own shoulders the task of insuting that its own natural resources shall be developed to the full. By designing this, it is believed that employment will be provided for all living standards will be unproved and a fuller enjoyment of ble made possible for everyone. In short it was Aus trains a plan to ach ever the second of the farmous freedoms outlined in the Atlantic Charter—freedom from want.

And so with this policy as her goide. Australia began to prepare for the difficult per nod that must follow the change-over from war to peace. The National Works Council amounted its plan to provide 4 000 separate post war projects. These will put the gow control policy of full employment into oil of the projects was a scheme for the unification to standard gauge of the entire Australian railroad system ferhaps it would be stallar actional system ferhaps it would be

a good idea to explain just what that means You know that Australia is a vast island continent whose land area is just a litle less than that of the United States. This huge land area is divided into six states each of which has an elected i ariament to adomister its domestic affairs. In the early days of railways, communities were small and scat tered and there were no companies prepared to put sufficient capital in on six ya estimute as a railroad. So each state government un detrook the task of constructing its own.

railroads. When each state had completed its system New South Wales and Western Aus tralia had gauges (width between rails) of a leet 81/2 mches \ ictoria had 5 feet 3 inch es and Queensland had 3 leet 6 inches South Australia which I es between Victoria and Western Australia had both 5 feet 3 mch and 4 feet 81/2 inch gauges These varia tions in gauges have caused great expense and loss of time because goods have to be changed from train to train at most state borders And so the National Works Council a body on which each of the six state government leaders has a place has now de cided to proceed immediately with the colossal task of unilying the gauges to 4 feet 81/2 inches The preliminary steps alone are expected to take eleven years to complete and will cost at least \$ 47 000,000

Tour events of pol teal s an ficance oc curred during reas in Australia. The first in these was the arrival of the Duke of Gloucester brother of king George 11 to take upduries as governor-general of Australia. The second was the trage death of Wistrial as greatly loved wait the prime mini ter John Curin The third was the election of Joseph Benedict Chiffey as prime minister. The fourth was the announcement of the Sustral ian Government's extensively planned immugration prolicy.

In record og the Duke of Gloucester a ar tival as governor-general it might be well to



explain what his functions are and how Aus tralia stands in relation to the British Crown The Governor General of Australia is George VI s direct representative in Australia It is not always easy to understand just what re sponsibility that involves. Australia is a free and independent member of the British Commonwealth of Nations Perhaps the best parallel to the king's position is that of the president of many companies each of which is independent of the other When he sits as president of any one company he is guided by the yo ce of the shareholders in that concern So it is with the king Atthough he is the president of both England and Aus tral a when matters concerning Australia are before him he must be guided by the voice of his Australian ministers to law passed by the Parliament of Britain can have any authority over the people of Australia That is why a governor general does not gov ern but becomes the personal representative ol the king in the councils of the Australian people

The late prime minister John Curtin was a widely respected and beloved leader He directed the complete war mobilization which non Australia such renova among the nations of the world fife died quietly in his sleep on July 4 at the prime minister a ohi call Canberra residence H is death followed a general illness which had persisted a nece November of the pres ous year. One of the first people notified of his death was Press.



John Curtin (left) and Joseph Benedict Chiffey

dent Harry Truman President Trumans comment on his passing was He brought to the public service of his country not only a great ability and integrity but a deep sense of loyality to the principles which guided the Dunted Autons through the war so victors onally ended in Europe and so successfully waged in the Iar Fast General Doughts waged in the Iar Fast General Doughts mately associated referred to him as of the great of the earth.

AUSTRALIAS NEW PRIKE MIRISTER JOSEPH BRREDICT CHIFLET

John Curten was followed in office by Joseph Chifley who was elected leader of the Federal Parliamentary Labor party the Government party on July 12 1945 His ele vation to the post of prime minister climaxed nine of the most incident packed days in Australian parliamentary history for in that time Australia had three prime ministers-Curtin Deputy Prime Minister Francis Forde who acted in office until a new party leader was selected and finally Joseph Chiffey Chiffey who was Federal Treas urer in Curtin's Cabinet began life as an apprentice in the New South Wales state railroad service and had risen to locomotive driver when he left the footplates for politics

One of the first appointments made in the new government was that of a Minister for Immigration The newly appointed minister Arthur Augustus Calwell who is also Vinis ter for Information followed his appoint ment with an important announcement about Australia s immigration plans. He con firmed the Government's intention to raise the populat on from 7 300 000 to 20 000 000 by the swiftest possible means. He added however that the Government will not em bark on any large scale immigration prograni until its own house has been set en tirely in order By this he meant that when the Austral ans in the services and those who had gone to other forms of essential war work were once again settled in normal hy ing the door would be opened for others to

come in The Government is looking to Europe and the United States for the bulk ol its immi grants and has permitted hundreds of American and British service men and women to take their discharges there. First step in the plan will be to bring out 54 000 British war orphans who will be schooled and trained for work and living li Australia. They will be taken to Australia at the rate of 17,000 at



By John Paul Andrews, Executive Editor, Air News Magazine

COME day we shall fly peacefully on the Dypower that destroyed kincohma and Nagasaki. But that day is almost certainly a long way off. For one thing atomic energy is not likely to be used in existing airplanes and airplane engines designed as they are for more commonplace methods of propul sion. And as you know screenfulst investigation and any sou know screenistst inventors of the propulation of the propulat

So let us consider the airplanes which are already flying and not so much those of an age to come. It is the planes that are in the air and in the factory now that we shall know in the next few years. It is these planes that will be the victors over time cost and danger in opening a new era of mass world

circling transportation. It is interesting to look back a lew years in order to obtain a true picture of aviations a source. Before Pearl Harbor the twin channel Douglas DC 3 and the Lockheed Lodestar transport planes—just about all of aviation to the common observe—traveled through the air at speeds of about 175 miles and hour Art battles, however are won and

lost in manites not hours So all the fighting nations designed and built military planes for more speed and then still more Frigmes for more speed and then still more Frigmes Designs became aerodynamically more efficient planes were cleaner (resistance to wind decreased) and smoother so that all of them slid through the air with an ease undreamed of usif the vears before the more speed and second them.

The 300-mile an hour mark flashed by then the 350-mile-per hour speed Finally at the war a end. All ed fighter pilots were flying and fighting at over 425 miles per hour in planes such as the Republic P 47 Thunder bolt the North American P 51 Mustang and the British Hawker Typhoon The big fel lows went right along with their smaller brothers Boeing Aircraft Company engineers developed the Boeing Stratocruiser from ber wartime twin the B 20 Superfortress The Martin B 26 Marauder gave rise to its trans port relative, the Martin 202 The Douglas 54 Skymaster became the commercial DC-4 and had a new sister in the fifty-six passenger DC-6 Lockheed's C 69 Constella tion replaced cargo space with seats and made ready for the eager narush of travel



Stheduled for oversees and domestic use by Trans-Canada Air Lines this forty payrenger air lines in a version of the C 54 Skymaster military frampers

hungry passengers All these planes fly gaster, father and more economically by far than their pre war ancestors. And they are flying now. The greater things ahead are impredictable Why even now a plane with wings longer than an entire football field is being built. It is the Hughes Hercules, a mammoth wooden flying boat, capable of cartying 300 passengers of transporting as cargo Glein L. Martin's big plane, the Mars's.

Triogress in air speeds went so far, and then it came to a temporary hist Propellers could absorb no more power even though engines had grown to twice their pre war size. Until planes without propellers were designed aviation was held at about the soomile-per hour level. Then came jet planes,

which were built to fly without propellers All of us are familiar with skyrockets Military rockets have been in existence for a long time Francis Scott Key wrote of "the rockets' red glare' in 1814 But man carrying rockets had never been attempted putil Dr Robert H Goddard began experiments in 1930, at almost the same time as the an nouncement of Baron Fritz von Opel's rocket powered airplane in Germany Rock ets, however, burn away their fuel as they fly A new type of engine was needed, one that could operate on a more satisfactory fueling basis so that longer trips would be possible. And that was the beginning of jet propulsion, where the end will be nobody vet knows

Scentists and engineers learned how to draw are not the nose of an arphane or automobile, heat this air to increase its pressure, their release it through the rear end of the vehicle. Here was a means of making plantes move along at tremendous speeds. Inventional so learned that speed increases as a plane climbs higher and higher above the earth.

where the air is less dense and offers less resistance to the movement of any object. To understand the principle of jet propul

son, one needs only to puncture a toy had too me with a pin a she are is released through the twy hole, the balloon moves rapidly in a direction opposite to the pinhole. The speed at which it moves depends upon the pressure of the air within the balloon itself before the hole is made the higher the pressure, the greater the speed And, for a given volume, warm air everts greater pressure extra the present of the pinhole of

It was this demand for tremendous heat which first handicapped the jet plane engineers. To build the fans which force the hot gases out the rear of the plane an unusual metal was needed. It had to withstand ter rific temperatures, produced by burning ker osene-the common jet fuel Here American engineers took over the projects which had begun in England Using turbines, or large blowers, originally developed as supercharg ers for Flying Fortress engines, the engineers greatly increased the efficiency of Great Bnt ain's Whittle jet engine. The result was the first American jet airplane, built by the Bell Aircraft Corporation and known to the United States Army Air Forces as the P-59 Airacomet From the Jessons learned with this airplane a newer and better type was developed, the Lockheed P 80 Shooting Star It was the first American plane to approach the speed of sound

PLANES WHICH TRAVEL AS FAST AS SOUND BAVE LONG BEEN THE GOAL OF ENGINEERS

Sound, as you know, travels about 150 miles per hour. The speed of sound, known as sourc speed, has always been the goal of most avaition engineers. The jet plane most nearly approaches this speed now and, with further refinement, may some dry lead to the desured goal.

In 1944 a jet amplane flew from Los Angeles to San Dego, a distance of about 123 miles, in just one; revise minutes That 123 miles, in just one; revise minutes That 123 miles, in just one; revise minutes That a major Late of approximate his proposed in the proposed of t

Angeles at eight fifty nine the same morning But jet propulsion is hardly more advanced than regular engines were when the Wright brothers made their first flight. We have only indications of what we shall accept as a regular thing five or ten years hence Most aircraft engineers now picture 1 200 mile per hour speeds as commonolace within ten years If their forecasts prove accurate we shall some day fly from New York to Chi cago in forty five minutes from New York to London in less than two hours from

Montreal to Rio de Janeiro between hinch and dinner, or around the world in less than THE AVERAGE DRIVATE OWNER WILL NOT HAVE A RELICOPTED FOR SOME TIME

a dav

The straight un-and-down airplane known as the helicopter is another miracle of prog ress It has been said that every airplane in ventor from Leonardo da Vinci to the pres ent has tried to perfect this type plane Recent years, however have seen the first measurable success in the helicopter field Able to rise directly upward to descend from any altitude into a space little larger than the average lawn to hover or stand af most still in the air for long periods of time the helicopter is as versatile as a bird. Heli conter owners will never be limited in their travels by the scarcity of amports because any small clearing will give them safe haven

Unfortunately helicopters are still very expensive They carry only a few people and are somewhat slower than low-cost standard planes They are at the same time difficult to master Pilot training for a helicopter lasts as much as 100 hours where regular air planes can be flown safely after less than to hours of instruction. The belicopter will appear this year or next year on commercial operations carrying mail or farm produce to remote areas and moving cargo from cities to suburbs. However it will not become available to private owners until mass pro

duction brings low prices The private or personal airplane now ranks as the most important item in our aviation industry s future. Costing httle more than a medium priced automobile these planes will carry two people and a fair amount of baggage at speeds exceeding 100 miles per hour, and over distances of 500 miles and more without re fueling They will use less gasoline and oil than a small automobile and will be expensive only in fixed charges like insurance and storage Several types have been introduced which are driven like automobiles and are just as safe. It will be many years before every family owns an airplane but some 350 000 people will own their own planes within the next three years

During the war airplanes were designed to land and take off in as small a space as possible This improvement will make a great change in many new airports. Some of them can be very small and still be practical and nseful

Prior to 1041 fewer than 300 American cities had airports large enough to take ad vantage of air line travel But with more and more communities adding landing facilities and with aircraft advances that permit smaller areas for landing and take-off regular air service will become available to over ooo towns and cities in the United States Canada too and Mexico are advancing to establish a vast network of North American airports Most of these will be simple clear ings on the outskirts of towns Many will be located right in the heart of large cities Only a few will be large enough to accommodate the new commercial air liners But all will be finks in a never ending chain which will tie people and places together

In 1940 there were fewer than a dozen air lines operating from one country to another Today there are more than fifty The planes of these companies will carry the flags of filty four countries. They will crisscross the globe in air routes so complicated that every important city on the face of the earth will be within sixty hours of your home town. In some ways this new world wide aviation is a result of the war, because the United States Army Air Forces Transport Command and the Royal Air Force Transport Command built most of the airports and installed most of the equipment at remote corners of the world But in other ways world air transpor



The Hawker Traboon one of Britain's best fighters

tation is a direct outgrowth of a desire for permanent peace on the part of the United Nations

CAMADA'S SUGGESTIONS FOR A WORLD AVIA TION POLICY ARE DISCUSSED AT CHICAGO

When Pan American Airways one of the original and best known world wide compa nies first sought air routes in foreign coun tries it dealt directly with foreign govern ments From them Pan American obtained landing privileges and other concessions necessary to long distance flying. The air was free but the land was not With fifty four countries planning entry into commercial aviation it was absurd to think of each separate air line dealing with so many gov ernments An official policy was needed to control air commerce. That policy was born at Chicago in November 1944 when fifty two nations sent delegates to the loterna tional Civil Aviation Conference called by the Un ted States State Department

At this conference Canada suggested that the governments form an organization who would control air worthiness of planes pilot fitness and similar standards. At the same time they would authorize a non government association of air line operators to settle the question of fares and routes as private busi

Most of us have heard of the famous Four Freedoms which grew out of the Atlanto Charter You may also have heard of the two freedoms and five freedoms of avia ton decided upon at the Chicago conference But not many people seem to know what

these latter freedoms are

The nat ons which accepted the two free doms agreed to permut planes from other nations to fit over the r territory in man one things and to laid for fine emergency and other non revenue purposes. In other words a Bittak angibne from Bermuda may cross over New York Vermont or Vassachus et son its way to Canada—the first fereism setts on its way to Canada—the first fereism setts on its way to Canada—the first fereism which we can be compared to the control of the cont

The third freedom allows planes of onecountry to discribage passengers in another country. The fourth freedom permuts a plane to pick up passengers in a foreign land for the journey home. And the much discussed fifth freedom to it did not the planes of one nation to pick up passengers in another country and discharge them in a third country. In other words an American plane would be allowed to take on passengers at London and discharge them at Stockholm Thirty seven nations accepted the basic

Intry seven pations accepted the dost Chargos agreement which established a tem porary international air organization, known as the growing construction, known as the growing construction, known as the growing construction of the two free doms and five freedoms problems and it is more than bkely that a compromise will soon he reached to goe travelers fast champ comfortable air service to every corner of the world

In the meantime aviation in the United States Canada and Meaco provides continually improving service to more and more people. There are many air lines serving American Canadian and Mexican cities To how astation one should know the names of the major lines as well as the regions which they service.

FOUR TRANSCONTINENTAL AIR LINES NOW OPERATE IN THE UNITED STATES

In the United States at the present time four art hero operate from the Atlantic coast to the Pacific coast. The oldest of these to United Air Lines 11 cuts directly across the North American continent from New 104 to San Francisco over the more or less straight line route first used by the Government's air mail pilots a generation app. United has been flying this route since 1928.

Once known as the Lindbergh Line Transcontinental and Western Air Inc., was the second cross country air line to carry passengers. Its routes originate in New Jork and run diagonally sonthwest to Kansas City and Texas then angle northwest to Los Angeles.

American Airlines Inc. the largest of all domestic United States at lines was the third company to offer transcontinental service One of its router runs southward from New York to Washington D. C. angles southward through Tennessee to Teras then follows a fairly straight line westward to Los Angeles. Like United and TWA American has been operating for more than ten years as an intropriate Inh. between coasts.

as the important time between Colors to Colors The most recent addition to the east Access American network of the most force and the colors of the model western United States North west in 1984 received permiss on from the Government to fly directly from Minneapolis to New York 's a result, Northwest now

- Andrew

operates across the continent flying from New York to Detroit thence to Minneapol's and then directly west to Seattle

Turning from the cross-country to the regional air lines in alphabetical order we have. All American Aviation This organization has its headquarters at Wilmington Delaware and operates a unique air mall piet, by service among the smaller cities of Pennsyl vania. West Virginia Ohio and New York. Remil Ariasos. The nam offices and

vania West Virginia Ohio and New York Bramif Airways The main offices and hangars are located at Dallas Tevas It serves the cities lying between the Gulf of Mexico and the Great Lakes in an area roughly bounded by the Mississippi River on the east and the Rocky Mountains on the west

Chicago and Southern Air Lines The area served is aptly described by the company name with routes extending from Chicago and Detroit on the north to Louisiana and Texas on the couth

Colonial Airlines This company has but one main foute but its operations on that run between New York and Montreal have

won a patronage challeoged by few of the Offi al Un ed Sa es Ma ne Corps pho graph A Verght Cores of fighter plane fired its load at rocket projectiles at a Japa sope alroughold an Oklaswa Offic al Un ted S stea Navy pho or aph Japonese zujejda plane goes down in Same befo e the accureta firing of enti elicreft augnere fic al Un ted Saes Navy

larger air lines. In recent months Colonial has begun a new Ottawa Washington service to give government officials of the United States and Canada a fast travel way between capital cities

Continental Air Lines Operations are based at Denver Colorado planes fly a rough square in the Great Plains states with corners of that square at Denver Kansas City Missouri Carlsbad New Mexico and

San Antonio Texas

Delta Air Lines Started in 1027 as a crondusting service this line cuts sharply across the southern United States between Texas and South Carolina with the main I ne cui in two by a heavily traveled route to Cin cinnati

Eastern Air Lipes Headed by Eddie Rick enbacker America's greatest flying are in World War I its headquarters are at New York City It runs from New York to Florida on a direct north south route and to Texas.

on a diagonal route 'Ind Continent Airlines One of the small

est air services it follows the Mississippi River in a north south direction carrying passengers from Minnesota and the Dakotas to Louisiana

National Airlines Its 2 000 mile route serves all Florida cit es New Orleans and

New York City

Northeast Airlines This company operates in the region which its name describes. The routes extend from New York City on the south to Montreal and Moncton in New Brunswick on the north

Pennsylvania Central Airlines This line is umque in that it serves more state capitals than any other line in America. It operates in the great industrial region bounded on the north by the Great Lakes on the east by the Atlantic Ocean on the south by the Ozark Mountains and on the west by the Missis

sippi River Western Air Lines With its Inland Air lines subsidiary, Western connects the big cities of California with the thinly settled states of Idaho Montana Wyoming and South Dakota on a route which fans out from Los Angeles to San Francisco on the north to the Canadian Rockies on the north west to South Dallota on the northeast and to Colorado on the east

Canada has two major air lines Trans

Victoria in British Columbia

Canada Air Lines began operation in 1937 with its 122 mile Vancouver to Seattle flight It has a nee expanded to include coast tocoast travel of over 5 000 miles from St. John's Newfoundland to Vancouver and

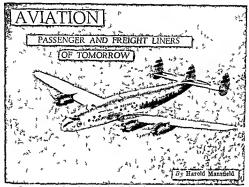
Canadian l'acrific Air Lines came into be ing in early 1042 by consolidation of several Canadian air transport companies Its routes run northward like arteries from the man east west lines of communication into Labra dor northern Ouchec northwestern Ontario the Praine Provinces Northwest Territories British Columbia the Yukon and the shores of the Arctic Ocean They connect with Trans Canada Air Lines and the leading air lines of the United States

In Mexico there are a number of small lines with largely local service and a few big companies which provide the connecting links from Mexican cities to the Umted States Cuba Central and South America The latter include Compania Mexicana de Aviación (Pan American World Airways) American Airlines de Mexico Aerovías Bran eff Compania Mexicana de Aviacion Ser vicio Aereo Panini and Taca de Mexico

These are the air lines of North America at the moment The coming years may eet fewer individual companies as routes and organizations are joined together However aviation s true growth will be measured more by the number of communities and people it

serves than the number of air lines operating Meanwhile the sirplane which was born for peaceful use in 1903 has finally come of age as an instrument of that peace It will probably never again serve the mutary forces as it has in the past because the a r war of tomorrow promises to be largely a conflict between pilotless rockets and rad o controlled atomic bombers. Using the air plane peacefully however, can indeed further the efforts of a peace loving world





From coast to coast in ten bours to the timetable followed by the TWA Luckhend Constellation

HROUGHOUT the war people looked forward to the promised 'age of flight which would come as a result of the wide spread use of aircraft in nartime Now the age of fight is here Already more people than ever before throughout the world are thinking in terms of traveling by air they are sending their mail by air and sending the r packages by air instead of hy ground methods of transportation. The reason why people are expected to take to the air in larger numbers than before the war is that there will soon be more air liners available operating more trips per day landing and taking off at more cities and towns than ever before Planes will make their trips much faster than d d previous airplanes The air I ne ticket will cost less than it used to cost And more amportant scheduled transwill be carried out with complete rel abil ty even in bad weather

The airplanes that will make all this possile are now being built and some of them are aiready built. They will not be so differ ent from previous a rplanes in general appearance except that some of them will be much larger than customary air line trans ports The bg d firences will be in things unseen—engineering improvements and ned developments that were perfected for military use during the war will gradually be come available for all transport airplanes operating in the peacetime world

Greatest of all these developments is ra dar the electron c sequipment that enabled bombers to see the r target despite dense clouds that enabled warsh ps to see at tacking lighters approach in in the night or through heavy weather and enabled mit say amplaces to take off and return again in thickest fog Radar will be apple of to comtraction to the control of the comment can be unsulfated at a provise and on possenger logics.

Radar as you know operates by sending out yeary shave and then proxed ong their echo as they bounce back from the hand below or from the objects ahead Echoes have long been useful for may gat ng m fog. The sh ps whistle blows then the men locate the shore by I stening to the echo of the whistle. In the case of radar we get an electrical echo and at such a rapid rate that it is actually possible to form an



The Hughes H.-4 is the world a largest airplane. It is designed solely to carry freight. Here we see a B 29 and a P.-51 Mustang ahows ler comparison.

image, or instantaneous picture, of the objects that are being 'viewed' through the

Radar will mean a great deal to air trais portation Bad weather will no longer limit flying By using various types of radar and other electronic equipment, it will be pos sible for the air liners of tomorrow to anproach the airport through thick log rain or snow, and to glide down a clearly marked (though invisible) path to the landing runway It will be possible for airport operators to scan the overcast skies and see all the air planes approaching the field on a radar screen although they are invisible to the eye With special equipment it will be possible for air liners to see other planes near them in the sky, and to see mountain peaks or tall buildings in their path although these obstacles are veiled by fog and clouds When such equipment is fully installed it will mean that air line transports can fly on planned schedules throughout the day, and day after day throughout the year, regardless of the weather

The new are liners will have other important safety advantages: Their wangs and fail surfaces will be internally stated so that when they fly through snow or sleet no see will form on them. On provious arrplanes, see will form on them. On provious arrplanes, see of the many states are supported about the forming on the wings also produced about the front edge of the wing and periodically filled with air. But with heated wings the ke can not form at all.

Many of the new aurplanes will have reversible pitch propellers After such a plane has touched the ground the propeller blades can be turned so that they push the art for ward instead of backward, quickly bringer the amplane to a stop. If there is snow or ce on the amport runway, and use of the wheel brakes might tend to make the art plane sked, these new "propeller brakes" and in provide a simple means of bringing the big transport to a stop

The new ships will have improved instruments to all the pilot and co pilot in flying and landing. One of these is the 'true alim eter' which tells the distance from the ground at all times with a strictly accurate measurement to within a few feet.

The big transports of tomorrow will be able to fly at very high altitudes, above all normal storm clouds, where the air is smooth And they will have long range so that even when storm clouds are extremely high the pilots can easily detour around them.

Thanks to wartime developments of mili tary airplanes, the air liner of tomorrow will be faster-so fast, in fact, that most normal long distance trips can be made in a few hours during daytime without the necessity of going to bed in berths at might. Here are just two examples of the high speed of some ol the newest transport airplanes the Lock heed Constellation, in 1944, from Los Angeles to Washington, D C, in 6 hours, 58 minutes, an average speed of 330 miles per hour, and the Boeing C-97 Army transport in January, 1945 from Seattle, Washington to Washington D C, in 6 hours, 4 minutes an average speed of 382 miles per hour (The Boeing C 97 is the military version of the Stratocruiser air line transport) These were speed flights but even in normal air line op erations, planes like the Stratocruiser could make the 2 454 mile flight from Seattle to New York in less than 9 hours, with a stopover in Chicago From New York to London would take about r11/2 hours of flying time From San Francisco to Honolulu would take 8 hours from Chicago to New York, 21/2 hours from Seattle to Shanghai China, by way of Alaska, less than roll bours flying time

THE QUIET AIR-CONDITIONED TRANSPORTS OF TOMORROW

Air passengers will find the new transport planes almost as comfortably furnished as their living room at home. This will be eye-cally true of larger air liners, such as the Douglas DC-6, the Lockheed Constellation, the Boeing Stratocruser and the buge Consolidated Model "37" Improved sound proofing will almost sleence the sound of the

mighty ensures outside the calin Labin su percharging or high bittude are conditioning will keep the civilin ventilated with nor maj will keep the civilin ventilated with nor maj attmosphere, even when flying at an altitude of 15,000 feet, where the outside air is thin High Hittude are conditioning is ecoupil held by blowers or superchargers coupil held by blowers or superchargers of the hitting of the hitting of the hitting as the blass more and more air from the civilin loss in one pen surply as the air gets fluoner at hich altrude.

Interiors of the planes will be attractively decorated Scats will be the most constitute ble that designers can derive with easy red ing cushioning. The Stratecturer will have an observation lounge in the lower deed, below the main passenger deed, where the an travelers can go for diversion to ut and fread, or talk with fellow passengers of look out the wind wes just as in the third car or observation lounge of a modern streamlined.

still be considerably loner than the cost of

railway train

With all of these improvements the cost
of flying in these great new transports will

with sepetables and fruits flowers newspa pers and magazines mail personal packages and so on

It is expected that there will be a steady growth in the use of air transportation it only in our own country, but throughout the world as well. "such transportation will mean a great deal to backward countries which dinot have the fine highways and rughways than we have had for years. It case I getting around the withil by air shill men also that there will be fetter understanding and their precieful relations between the receipted their precieful relations between the receipted to each other in the talk tause of the dia lance between them.

Looking still further into the future enginess are thinking of new and unconventional types of aircraft driven possibling to be propellers but by jet propulsion or by other new methods. But there awast further other new methods But there awast further engineering development before they are put with use in passenger transportation. That day however, is not us far off as one would have thought a few years up.



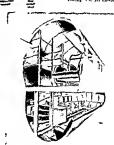
A cutaway view shawing the cabin prongement of the Social Stratecratter-mirst of the large stratages of the lattre to boult.

The Stratecration of the large stratages of

The Strategraless a upper dath is used for day passoners keels while his lower syst cable is a combination obterration disting room and louge

tracking in pre-war and wartime planes. This is because the designers have found many ways to make the new ariphanes more they will carry greater loads and they will go faster and farther for every doll ar spent in operating costs. Greater stream lump better mogs that will earry a heavier load and many other advancements help to make possible this lower operating cost.

Not only will the cost of a tacket for an ampliane tryp he within the reach of most people but the cost of sending express cargo by air will also be gradually brought down large cargo compartments will be provided in the passenger planes other attpfanes will carry till loads of cargo. Many types of goods will doubtless be shapped by air, especially where peed of delivery is desired, as



BUIKS
about science for young people

By May Lamberton Becker Reader's Guide in Books New York Herald Tribune



Drawing by James Madennid from ROCKET AND JETS by Kerber S Zim published h Harcourt B nce 48 Company Inc.

I Twould be more amusing than accurate to say that the years books for young people have been actually keeping up with science For in the last few pears—sepecially the one just behind us—science I as made leaps so tremendous that it has gone clean leaps so the science of the state of the science I as made leaf then gazing and gasping at arbone general content of the science of t

But while that blind and deadly weapon the robot bomb of the Germans was still devastating London a book for older boys appeared that gave them a history of the use of various rockets and a description of modern types used in battle today with a preview of some that may be used in the future.

The sa Rockets And Jers by Herbert Spencer Zim (Harcourt Brace and Company) It tells about high altitude rockets and the problems involved in possible future traval between the earth and other planets it describes the German robot and though the book appeared in advance of Hiroshima it tells something about the possibilities opened by atomic energy

This is seenthic writing for soung people that really meets their needs. We all know that if a young person is strongly interested as a subject he will read any book about the strong and the strong and

audience out of young and more mature readers I ARCHIURS SI DIMARINES and AIR NAVIGATION are others. In MAN IN THE AIR this author explains the effects of flying on the human body. All these (Harcourt Brace and Company) have many photographs and drawings.

Invention and applied science has a shauss been well represented in our books for young folks, and those for the year have been un commonly interesting 1 flow, into Auronous Learners of Kores, by VI lim with the common terms of the common of the common terms of the devel opment of the automobile Valence in Valence

colored pactures what goes on behind the scenes in picture mixing John J. Floherty has achieved a special fluency in telling fact stories by a combination of plain text and beautiful photographs. His latest is Thomise Gold first ROWANG OF OIL J. B. LOPAIN COMPANY OF OIL J. B. LOPAIN COMPANY OF OIL J. B. LOPAIN COMPANY J. BERINSO THE MICRO PRIOR F. J. B. LOPAINOR COMPANY J. SONS what goes on before and during a broadcast at one of the big broadcasting stations.

CLIMING OUR FAVILY TEEF by Mer Nowlodf pectures by John English (International Lublishers) tells twelve year-olds about the bhological development of man Mays Way from caveman to sky scraper by Ralph and Vdelne Linton (Harper and Brothers) traces his development from cave deellings onward for the same age-rance



Illustration by Richard Florthe from PICTURE BOOK OF ASTRONOMY by Jarome 5 Mayer pub by Lothrep Lee end Shepard Co

For younger children is a Pictima Book or synovony by Jetome Sydney Meyer (Lothrop Lee and Shepard Company) with Richard Floethe s dran atte illustrations Av Orvy Door, To Cleasiarse by John L Horring and George C WeGnness pictures by Helen Armstrong (D Appleton Lentury Company) g ves ten year-olds an introduction with experiments guaranteed safe

OCEANS IN THE SKY by Vera Edelstadt with pictures by Louis Banin (Mired A Knoof) presents to ten year-olds the an cient tremendous story of water Burnten Treasure by Marion B Cothren (Conard McCann) tells us about the reological back ground of coal and even more about its hu man side in mining and through the part coal plays in modern life THE STORY OF WAR WEATONS by Marshall McCl ntock (| B Lippincott Company) is for the teens a brief history of mankind in terms of mile tary defense from the primitive man's club to bazookas and booby traps 11on Planes ARE MADE IS IN a valuable series by the Aviation Research Associates (Harper and Brothers) There are two new additions to a good series on the great industries of Amer ica Josephine Lerry & THE ELECTRICAL IN DUSTRY AND THE GLASS INDUSTRY (Long mans Green and Company)

Often as the mysteries and marnels of the Golf Stream have moved young students of geography there has not been until now a book for them entirely devoted to this face nating subject. This Gutz Friends by Ruth Brinder, has lovely pictures in their of blue by Helene Carter (The Vanguard Press). This won the prize for the best book for children under twelve in the Spring Testural of the deep the development of the strength of th

the New York HERAED TRIBUNE Geography from the air a natural new travelers is the subject of SK1 Highways by Trever Lloyd (Houghton Mifflin Com nany) which has drawings by Armstrong Sperry that make a world-circling plane trip seem someth no in which one is personally GEOGRAPHY OF THE LACTRIC ISLANDS (J B Luppincott Company) tells about the places where so many of our boys have been mak and history and shows what these regions are like in years less strenuous THE LAND WE LIVE ON by Carol Lane Fenton and Mildred Adams Fenton (Doubleday Doran and Com pany) gives in large photographs and brief well pointed test a clear idea of the many kinds of soil and landscape we have here in the United States and makes out a striking case for conservation

Natural batton for little children already well represented more yucumb letrature has thus year been resting on its laurels bit there are two excellent new books. Fassi Avistus by Dorothy and Nils Hogmer (Dr. of Linestrate compan on volume to their Avistus by Dorothy and Nils Hogmer (Dr. of Linestrate compan on volume to their Avistus by Millerd S. Bronson Tratistic or the state of the state

striking drawings.

As will be seen the year a books for young folks do not attempt to keep them abreast of the better developments in science. They do however make a well reasoned effort which we do not attempt to the down a directly for the down and the down and



E 74 1



Boy Scouts of America

to boys who helped the Food for Freedom

UNDREDS of thousands of boys joined the Boy Scouts in 1945 to share in Scout work as well as in fun and good times The Boy Scouts have programs for three age groups Cub Scouts are from 9 to 11 years Boy Scouts are 12 years old and upward Senior Scouts are 15 years and upward Among the Senior Scouts are Air Scouts Explorer Scouts and Sea Scouts

All three groups helped win the war In the eight war loan drives that have been held since the war began they took an active part in selling some two bill on dollars worth of

war bonds and stamps

When 90 per eent of the boys in a Cub Pack or Scout Troop bought war bonds and stamps regularly that Pack or Troop was given a special award by the United States Treasury Department This was the Scouts at War Minute Man Banner

General Eisenhower approved of the work of the Boy Scouts in the Boy Scouts General Eisenhower Waste Paper Campaign held in March and April The goal was 150 000 tons of wastepaper Cub Scouts and Scouts col lected more than 240 000 tons A World War II Shell Container with a citation from Gen eral Eisenhower was presented to each unit that collected a thousand pounds of paper for each boy in the unit

or the third year Boy Scouts took part in the Green Thumb Campaign to raise food crops Cubs and Scouts tended more

than 500 000 gardens Boy Scouts also worked on farms and helped farmers harvest the crops A Green Thumb Certificate of Merit was presented

program

In the spring of 1945 a campaign was held throughout the United States to collect good used clothing for the suffering people of Eu rope Scouts and Cubs did a fine job in this campaign They collected one tenth of the total of 150,000 000 pounds that were raised throughout the country

Boy Scouts work hard but they don t work all the time In 1945 for instance they went camping more than ever before Hundreds of them went to Philmont Rocky Mountain Scout Ranch the wonderful wilderness camp in New Mexico Cub Scouts had fine times in day camps and did many interesting things in the r home neighborhoods

Air Scouts had a chance to camp and to study Air Scouting under Army Air Corps leaders in special training held in various

On October 20 Scouts and Cubs from the New England states held their Annual Pil granage to the grave of Theodore Roosevelt About four thousand Scouts from the New England states took part

There are about 1 500 000 boys in the Boy Scouts of America and about 57 000 Packs and Troops There are Scouts in more than

70 different countries

Many Scouts and Cubs abroad suffered terribly during the war For their sakes Boy Scouts of America emphasized world friend ship and beotherhood A World Friendship Fund was begun to belp rebuild Scouting abroad The theme for the year was Scouts of the World-Brothers Together

BOY SCOUTS OF CANADA



B H Mortlock

Canadlan Scaula crousing the Inter noticeal Bridge be tween Canada and the United States in join Ame Ican Scouts al a weakend camp

WHEN Lord Baken Powell founded the Boy Soute most meren in 1995 he bated much of the color in 1995 he bated much of the color in 1995 he hard much of the Color in 1995 he hard to the Color of the traditions of the lamphs was that they must of a kind deed every day. This is the origin of the idea of the Boy Social Good Turn During the past year Canadas Boy Socials have done many good turns for the comment of the Color in 1995 he was a well of the color in 1995 he was a way and the color in 1995 he was a way and the color in 1995 he was a way and the color in 1995 he was

In kelowna British Columbia the local newspaper published an ed tornal telling about the need for a museum for the town The Second Trop of Boy Scoutt took up the challenge They made an old barn into a museum and stocked it with 4 ooc exhibits These ranged from a collection of Okanagan Valley butterflies to stiffed bods and rep tites and from Indian rel cs bundreds of years old to souvenins of the Second World

Another typical community good turn was done by the fight Toronto Volf Cub Tack. These punter Boy Scouts shive in binding the new Toronto Sick Children suspensial. The fifty members of the Pack suspensial. The fifty members of the Pack swatepaper drive and with the proceeds they bought a \$50 ketory Bond They gave this bond to the Hospital Building Fund.

There are many kinds of good furms One was the Seeds for Bittan campage. Can dam Scott gave several hundred pounds and can foot gave several hundred pounds better in Great Bittan for Scott Several furthers of the Bittan for Scott Several furthers of the Great Scott Save taken great interest in fire prevention and In reforestation schemes cention and in reforestation schemes of the Great Several Several

The Cornwell Badge is the highest Scout

award in the British Empire for fortitude. It has been awarded in Canada less than too tumes since it was inaugurated more than twenty years ago During the year the Corn well. Badre was awarded to Bobby Oke et. Bobby was injured in an accident in 1937 and has been confined in a cast almost ever since. Although he must the on his stomach all the time. Bobby has maintained a high standing in a chool work has kept up his souting and has even helped to tran remodels and has taked a number of airplane.

In Saskatchewan for the second year in succession uniformed Boy Scouts had the bonor of escorting the Speaker of the Legis lature to his chair at the formal opening of the Provincial Parliament

A Boy-Scott group is made up of a Troop a Wolf Cub Pack and a Rover Crew There were 2000 of these groups in Canada last year and churches were their largest spon sors. Scott membership during the year grew to a total of 92 976 on increase of the previous year. New tests because the previous year. New tests because the previous year. New tests because the previous year was program has been designed and put into effect for Senior Scotts.

Hts Excellency the Earl of Athlone Governor General and Chief Scout for Canada departed during the year Canada joined in welcoming a new British Empire Chief Scout Lord Rowallan who is scheduled to

visit Canada in 1946

During 1945 representative Scout leaders of South American countries visited Toronto Ottawa and Montreal They were received by Prime Minister W. L. Mackenzie king and were entertained by His Excel lency the Governor General and Princess Alice.

CAMP FIRE GIRLS

By C Frances Loomis

HAVE you ever taken care of a baby rat? Not long ago twenty little girls in a California town had great fun playing nursemaid to two of these lively creatures. The girls were members of the Blue Birds which is a funior club of the Camp Fire Girls You have to be seven years old to join the Blue Birds When you are ten you may graduate

into the Camp Fire Girls
These California Blue Birds owned two baby white rats each weighing only 20 grams A gram is a very small fraction of an ounce They named the babies Il teme and Superman The girls kept charts of the rats diets and weights Superman was lucky life dined toyally on powdered whole milk 100 per cent whole wheat bread and carrots Poor Wienie was given powdered coffee

white bread sugar and turning At the end of eight weeks Superman had grown into a fine, husky fellow He weighed 138 grams And poor Utenie weighed only 26 grams! This group of Blue Birds will never forget what a difference a balanced

diet can make

What we learn through pleasure we never forget is one of the principles of Comp Fire activities In their weekly meetings Blue Burds and Camp Fire Girls choose what they would most like to do with the help of a friendly leader It's no wonder that more than 340 250 girls now belong to the Camp

Fire Girls Senior members, fifteen years or older are called Horizon Clubbers They have a special program to satisfy their more grown up interests which include personality and good grooming boy friends careers and community service Every year each Hori zon Club works on some special project such as helping with handicraft for children and servicemen in hospitals

Did you ever stop to consider just what re-ponsibilities you should be able to shoul der at your age? A group of Blue Birds in Oklahoma City made up the following list If you are between the ages of seven and ten veurs old see if you think you can do the following things

r Clean up quickly Act quietly in public places

Make more friends

4 Think twice alway interrupting Be able to do an errand

Read without skipping words 7 I rint without going off the line

Their leader told these little girls that making up this list was a real experiment in democratic living. The Blue Birds soon discovered that they were much more willing to live up to rules that they had helped to make

I very year Camp Fire Girls choose a na tional project and Hi Neighbor! was the 1045 one As the name suggests this was an adventure in friend hip. As a grand climate to the project many of the groups staged a Neighborhood Fair

Throughout the nation Camp Lire Girl served their country well as hospital aides form aides victory gardeners child care aides messengers and as purchasers and salesmen of war bonds. While serving their country Camp Fire Girls remembered the oung people of Europe and Asia They sent books clothes toys and other necessities to children in China Russia England and the liberated countries of Europe



One of the summer camp activities of the Camp Pire Girls was making Christmas t can for the Red Cross



MFRE can be no doubt that 1945 was a banner year for Canadians of the Rorld War II generation The year saw Ca nadian flyers and soldiers traumph in Eu rope it saw Canadian sailors complete their Atlantic convoy undertakings it saw Cana dian workers and farmers fill the largest production schedules ever undertaken by the country and it saw Canadian scientists con tribute greatly to mankind's most difficult exploit—the spl tting of the atom

The satisfactions joys and sorrows of \ E Day and V J Day were experienced by Ca nad ans in full measure at home and on the fighting fronts And with the announcements of victory over Germany and Japan the Ca nadian Covernment put into motion its al ready well laid plans for post war recon

struction and progress

With the close of the war, many figures on Canada's total war effort were reported to the nation. During the six years of conflict 1 000 000 men and 43 000 women went mto Canadian military uniforms and served on every front In the air crew alone 131 523 graduated from the famous Canadian-oper ated British Commonwealth Air Training Plan Approximately 7 000 buildings have ars and drill balls were constructed under the plan Most of the Royal Canadian Navy s war work was defensive Canadian warships escorted 25 343 merchant ships carrying 181 643 180 tons of vital cargo from North America to the United Lingdom Many other thousands of ships were escorted on the return trips to North America and dur ing the African campaigns and landings. The Canadian Navy lost twenty four ships in en gagements with the enemy Thirteen Cana

dians won the Victoria Cross during the war With the actual fighting over steps were taken to reduce the country's fighting forces The neal war strength of the Royal Cana dian Air Force of 232 roo was cut to 20 000 for the permanent air force after the war In 1939 there were only 4 000 Royal Canadian Air Force personnel Another law cut Cana da's permanent active army to 25 000 men supported by a six-division reserve. That is five times the size of the Canadian Army of 1939 Parliament also set the post war Ca nadian Navy at 10 000 men on active serv ace and 18 000 men in the Royal Canadian Navy Reserve There were only 1 700 men

After V J Day war production figures which had remained secret during the fight ing became public information Many of these figures were dramatic. For example Canadians had produced over \$200 000 000 worth of radar and optical instruments of types and des gas never before attempted by Canadian workers The first production unit of radar was shipped to the United States Navy in October 1041 two months before the Cearl Harbor disaster More than twenty major types of radar equipment were produced in Canada during the war

Another production secret made public in 1945 was the fact that the most efficient flame throwers of the war were developed largely by Canadians These deadly weapons gave the All es their final superiority in flame warfare on the Western Front and in the 12

cific zones A dramatic revelation was the news that

during the year at least 250 Japanese paper balloons carrying bombs and incendiary can

isters were dropped on western Canada. Research experts bomb-discosal squads air force personnel Royal Canadian Mounted Police and provincial police Indian trappers and forest rangers joined as a co-operative force and combed the great hinterlands of the West and North to receiver these missiles and render them harmless Fortunately most of the balloons fell during the winter and were bursed in the snow Had the loads been dropped in the summer the heavily wooded areas of the Pacific coast could have suffered seriously from fire

THE COST OF WORLD WAR II TO CANADA IN LIVES AND MORET

In 1945 it was estimated officially that the war cost Canada nearly \$17 000 000 oo The Government paid one hall of the mulitary and civil expenses by means of taxes It paid for the other half by borrow ing from the people of Canada During 1945 alone there were two Victory Loans and bonds totaling just over \$3,000,000 000 were purchased by the Canadian public

Besides the financial cost of the war Can ada paid in terms of Canadian lives. The total casualties up to May 31 1945 were dead 37 964 wounded 53 073 missing 2 366 In proportion to the population of Can

ada these figures are very high

In terms of civilian goods Canada like the United States actually gained through the war The British people tightened their belts -that is they had less civilian goods than they had before the war. But Canadians and Americans let their belts out a little They consumed more than they did belore the war

The per capita nurchases of civilian goods and services in Britain dropped 15 to 20 per cent from the pre war level but in Canada and the United States they increased to to 25 per cent All three countries cut down on motor vehicles-Britain where no gasoline was allotted for ordinary civilian use by 95 per cent and the other two countries by 52

The general upward trend in Canada and the United States as contrasted with the downward trend in Britain was shown in such stems as Food-down ir per cent m Britain, up 8 per cent in the United States and 6 per cent in Canada. Clothing-down 34 per cent in Britain, up 23 per cent in the United States and 22 per cent in Canada Household goods mainly electrical and met al products were down in all three countries but they were down 82 per cent in Britain as agunst 32 per cent in the United States and only 28 per cent in Canada

V C Day brought changes in Canadian production schedules Many wartime orders which had restricted the manufacture of peacetime goods were lifted Other orders were simplified However in its efforts t prevent inflation the Government did not suddenly lift all wartime controls. Some of the restrictions on production were remove i first Man power controls were eased And there was a slow but general return to normal business However price controls were rig idly held on many articles to prevent a sud den and disastrous increase in prices

In order to give the Government contin ued nower to act in a national emergency Parliament passed the National Emergency lowers act This took the place of the Wat Measures 1ct under which the Government had had emergency power during the war

vears

The year 1015 was an election year in Canada There was a general federal election and there were provincial elections in Ontario Manitoha Nova Scotia and British Columbia

VICTORY FOR THE LIBERAL PARTY KEEPS PRIME MINISTER KING IN OFFICE

The Liberal party which had won the general federal elections of 1935 and 1940 was returned to p wer in 1945. The Conserv atives came second and the Co-operative Commonwealth Federation came third The victory gave Prime Minister William Lyon Mackenzie King the record for length of leadership of a political party. He has held office for more years than any other Cana

dian prime minister

The lour provincial elections were inter esting There were three main political par ties-the Liberal the Conservative and the Co-operative Commonwealth Federation (or the Socialist) The first provincial election of 1945 was in the province of Ontario on June 4 It was won by the Conservatives though the CCF Socialists had a strong hope that they might be the victors. That was the first real Socialist setback. It was followed by another Socialist defeat on June 11 when the Liberals won the general federal election In October there were provincial elections in Mantoba Nova Scotia and British Colum bia Liberal Conservative coalition govern ments led by Liberals defeated the CCF Socialists in both Manitoba and British Colum bia The Liberals in Nova Scotia defeated both Conservatives and CCF Socialists



Smoke acrees apparatue used by the Canadian Army

However the experiment of the CCF So. cialist Government in Saskatchenan which won the 1944 Saskatchewan election con tinued to be watched with interest. The first legislative session ended on March 20 after sitting for six weeks. During that time 120 laws were passed a record in legislation Some of these new laws lowered the voting age from at to 18 increased old age pen sions increased workmen's compensations for injuries raised the gasoline tax from one cent to eight cents a gallon gave the govern ment power to take over certain industries to be operated by the government and set up a marketing board with wide powers over the handling of natural products. Other so, cialist schemes were also being tried out. One was a large farm co-operative organized in central Saskatchewan at a place called Landis

During the year two sessions of Parlia ment were held The first of these was the sixth and closing session of Canada 3 Nine teenth Parliament, which had been elected in 1940 It was dissolved in April The Laberal Government had been returned to power by the general federal election in June and the first session of the Twentfeth Parliament was called in the autumn These two sessions of Parliament passed many important laws to

help Canada recover from the war

For example the Government established the lowest and the highest price for selling Canadian wheat abroad War destruction and drought had cut the world supply of wheat and it would have been quite possible for Canadian farmers to have asked and recerted high prices for their wheat on the world market But to ask very high prices would have this effect countries needing wheat would rush into their own wheat pronuction Soon they would not want to buy Canadian wheat at any price. By keeping the price reasonable the Canadian Government has assured a market for Canadian wheat over a long term of years, and has enabled countries to use their energy and time for other important things besides growing wheat That policy is directly opposite to charging as high a price as a customer will pay It has proved once again that Canada can lead the world in economie reconstruc tion practices

Several steps were taken by Parliament during the year to expand Canada's trade partly by a revival of pre-war markets and partly by the promotion of new ones A Ca andtan Trade Commissioners office was opened in Portugal the first of its kind in

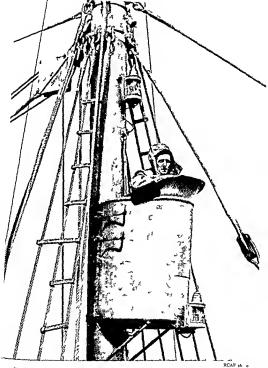
the Iberian Peninsula

Two months before the war ended in Europe the Government announced it would spend \$50 oo oo in the development of sociational training facilities and course in the post war period As part of this re-employment plan the Government set up a aine man committee to help shift men from the atmed forces into essential industrial jobs

A COVERNMENT PLAN FOR THE CARE OF CANADIAN CHILDREN IS TRIED OUT

In January Prince Edward Island was chosen for advance registration under the Family Allowances Act in order to provide experience for registration in the larger provinces By July 18 the plan was in operation Tamily allowance payments for 3,000 000 Canadian children were mailed Vinister of Health and Welfare Brooke Claston said.

Through family allowances, one-quarter of our nation will receive new economic opportunity for better institution, better shelter better clothing more education and recreation Family Allowances are a recognition by the people of Canada and their govern meats that our children must be properly carred for, and that the soundest way to do thus is to spread the cost throughout the entire country!



The new me tof a Canadan ake with keep week has H. Ha. and the kand forth he I cand as gring staying.

Canadan a run an Nigh. In those lawer yet. he weem ab a need the first con of hitter with 17 ga co. Then a content we hand to be here.

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At the first session of the Twentieth Par harrent the Government announced its plan to beautify Canada's capital city Ottawa and at the same time to convert it into a permanent national war memorial Plans for a new Canadian flag and for the recognition of Canadian citizenship were also announced Two conferences were held in Ottawa on the subject of Dominion Provincial relations The first one in August, laid the ground work for new approaches to Canada's enter nal problems. A number of federal govern ment proposals were accepted with a few changes at a second conference in November A number of discoveries and expansions

were made in scientific and industrial fields in 1045. The year also saw the announce ment of a number of war discoveries which had been under a security censorship In-February the secret of Wing Commander William R Franks ingenious flying suit was made public By using this suit fighter pilots were saved from blackout due to high air speed This gave the United Nations pilots a big advantage over enemy pilots

Another war discovery was a Canadian developed drug named heparin used with a tiny metal tube. The drug and the tube to gether enabled surgeons in the armies of the United \ations to save many arms and legs of wounded veterans. When a bullet or shrapnel cut an artery in two the tube was used to Join the break and the benarm drug prevented blood from clotting Hundreds of amputations were prevented by this Cana dian discovery

Using raw materials and steam from the government owned synthetic rubber plant in Sarnia a new chemical industry turned out styrene plastic a raw material never before produced in Canada Combs trays lenses and other articles for home and industrial use are made from styrene It is more trans parent than glass more buos ant than kapok and a better electric insulator than rubber It was announced in February that phal

bum a soft white metallic material used in

ret Cunadiana ta enter defeated Te: Malane and Majar C C. McDangall.

alloys was being produced for the first time in Canada at Flin Flon Manitoba

Much progress was made toward rural electrification in the three prairie provinces Both Manitoba and Saskatchewan completed their plans for the electrification of most of their rural homes. Alberta began an experiment designed to put electricity into 60,000 of that province a roo ooo farms

As a result of Canadian scientific investigation in the field of transpolar navigation aerial navigators in the polar regions can find their bearings in winter or summer keep track of changing compass readings and ob tain a reliable weather forecast in a fraction

of the time formerly required

There were several important developments in transportation By an Act of Parliament the Trans Canada Air Lines was given power to carry passengers across the Atlantic across the Pacific and along the southern skyways to the Latin American countries Canada became a member of the Commonwealth Air Transport Council which was set up to serve as a medium for the exchange of information on civil air trans port among Commonwealth countries The first jet propelled airplane flight ever made in Canada took place on September 13 when the Gloster Meteor flew from Montreal to Ottawa in less than thirteen minutes This trip took two hours and ten minutes by the

fastest train of that year The Canadian Pacific Rallway converting to peacetime travel was the first Canadian

rail travel by building sleeping cars having these appealing characteristics. Since more than 20 per cent of Canadians earn their hy my directly and indirectly by travel that development belped to produce many new post war 10bs

Canada entered World War II with forty ocean going merchant vessels and ended the war with more than 250 of them Some of these were sold but enough were kept to make Canada one of the maritime nations of

the world

The government of Manitoba established a fund so that a person injured in an auto mobile accident through the negligence of another but unable to collect money to pay hospital bills could get help. Motor car own ers in the province were assessed one dollar per year to build up the fund. The new lea islation was the first of its kind in North America covering traffic muries

The most notable communications devel coment was in radio The Canadian Broad casting Corporation opened its new short wave nineteen meter band transmitter at Sackville New Brunswick Reports from his teners on the continent of Europe showed it was the strongest broadcaster from the New Horld This was due to the antenna system as well as to the location of the station Ra dio maxes from Sackville travel in the most direct route to Europe and are free from the interference of the North Magnetic Pole

As in former years Canada was in the forefront of international co operation She played host to two important international



Twenty United Reliene are represented at a meeting of the International Civit Aviat an O gen ration le Montreal,

meetings One was the first session of the Interim Council of the I roussional International Civil Aviation Committee which was held in Montreal during August

In October Opelee City was the barth plan of the Food and Agrendural Organiza tion of the United Nations. The meeting was under the preliminary chairmanship of a Canadian Michael I. Pearson Canadian and bassador to the United States. The event was widely heralided as the beginning of a new world era when modern science and man's ingenuity would be combined to assure

enough food for every human being Canada sent representatives to the San Francisco Conference which drew up the charter of the United Nations Organization and her representatives with their staff of experts received prizise for their confinition to the discussions and agreements. The House of Common approved the charter on October 19 the Senate on October 19 and the ratification was deposited in Washington

on November 9

The Government announced its intention to part cipate in the international monetary fund and the international bank for reconstruction which had been set up by the Bret ton Woods Agreements These arrangements were intended to help the nations recover

ther peacetime product on capacities
In March Prime Minister Machenae
Aung want to Washington to confer with the
take thresheat, Roosevelt Soon thereafter an
the United States had agreed to cooperate
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my active as a reduction of barriers to
the United States had agreed to cooperate
output to seek a reduction of barriers to
both Canada and the United States recog
uned a common interest in working toward
the removal of discriminations and the
reduction of barriers to the exchange of goods
during only to the control of the control o

Prime Minister Mackenne king spent the month of October in Great Britain to discuss with British Prime Minister Clement Attle matters of interest to the two countries. On his way back from the United Langdom I rane Dinnister King vastied Mar y Truman President of the United States in November King Attlee and Truman met in Washington D C and discussed the future of the atoms homb.

Other forms of co-operation between Can ada and the United States modied a joint Canada United States Committee on Education It was set up by the American Council on Education and several Canadana educational organizations and sepan a survey of textbooks and other teach ing materials in the field of United States Canadian relations Conservation of fish resources of the Great Lakes was checused by United States and Canadian relations and they consider the conservation of the Cortal Lakes was checused by United States and Canadian officials and they recommended that they have been countries enter incommended that they have continued to the control of the Contr

treaty for th 8 purpose. Canada amounted in January that she would accept the mierum greement and the would accept the mierum greement and the cut all avantum which had been drawn up at Chatago the previous December Montreal to the country of the

the privilege to land for non traffic purposes
Canadian delegates attended the Inter
American Conference on Rad o Communica
tions in Rio de Janeiro in September And
Canada established its first legation in Cuba

Canada established its first legation in Cuba These were the chef ways in which Can ada in 1945 accepted her responsibility as a nation in the world community of nations And by these activities she became widely acclaimed as the leader of the small and



Boat-building on Nevis one of the Leeward Islands.

Carıbbean Islands

By Coert duBois

Member of the Anglo American Caribbean Commission

1942 1945

THE United Nations Charter was adopted in 1948 in the city of San Francisco, a long way away from the waters of the Cartibbean Sea. Nevertheless to the people who live on the Cartibbean stands the signing of that charter was of the very greatest importance. They were especially interested in the agreement of Great Britain Holland France and the United States to three of the chapters in that charter—Chapters 14 MI and MIII Let us see what these chapters ago.

Chapter AI is a declaration to the effect that the mother-counters recognize the prin tiple that the interests of the people of their tolones come first Great Birtian Holland France and the United States accept as a sacred trust the duty to promote the political economic, social and educational and vancement of these people. They are that asset them in becoming all the properties of the

Chapter VII sets up a system of international trusteeship. The purpose of this system is to carry out the principles that you have just been reading about. But the dependent Jerntones will have a voice in the matter of their trusteeship. Larch application of the system to any territory must be the subject of a specific agreement between the administering government and the depend

Chapter \III sets up a Trustee Council under the General Assembly of the United \alions Organization to supervise the work

ing of the international trusteeship system. This agreement means in effect that Great Britain Holland France and the United States have obligated themselves to work toward self government for the Wind ward and Leeward islands Barbados and Jamana Guadeloupe and Martinquie Curação and St. Eustatus Puerto Rico and

ration and St. Eustatus: Puerto Rico and the Virgin Islands: The goal of working toward self-govern ment is a high one, but we must not expect too much progress all at once. In most in stances progress will necessarily be slow. The vast majority of the people in many of the islands are descendants of slaves who were brought over from Africa. There are

The vast majority of the people in many or the islands are descendants of vlaues who were brought over from Africa. There are many among them who can not read or write. Fedoration is one thing that people must have morter to vote intelligentity untelligent voting is the foundation excell self government entry the control of the contro

when the war, the sound that the had to work much war, then sound that the had to work much more call of them had trouble in obtaining fixed and other essential supple a and they had to get together to work out their transportation problems. One way in which they worked together was to organize the West Indies Schooner Loo! This was a co-operature enterprise. The owners of rearly a bun dred schooners voluntarily schriftled to the



Part of the first of the West Indi

orders of a Pool Authority in Bridgetown Barbados The schooners ranged from 60 to 200 tons burden, and carried cargoes to noints where they were urgently needed, at freight rates fixed by the Popl The Schooner Pool was an emergency wartime creation and the time came when it was not urgently needed It bad done a splendid tob and it was giving employment to about 3 000 people ashore and affoat. It was still handling most of the inter island carrying trade. To give up the Pool and to go back to the old cutthroat hit-or miss methods seemed a pity So a peacetime organization has been worked out. known as the British West Indian Schooner Owners Association In its early stages this association will be assisted by certain funds carned by the old Schooner Pool, and these brave little ships will continue to spread their sails to the trade winds

Other peacetime problems are facing the islands Thousands of laborers were sent from the islands to the United States at van ous times in the last two years to meet the shortage of farm workers. These people were distributed from Florida to Maine and from New Jersey to the Rocky Mountains They were a great help in increasing the food supply. They got in the wheat and other harvests Some 40,000 of them entered the United States under agreements made with their respective governments which provided that they should be returned to their home islands at the end of the emergency This was generally considered to be the latter part of 1945 Back home again in the islands, it

can hardly be expected that there will be enough tobs for all of these laborers, as well as for all of the soldiers returned from the many theaters of war

HUDRICANES HAVE WRECKED HAVOC WITH COCONUT GROVES

The hurricanes of the last two years did an enormous amount of damage throughout the islands, particularly to the coconut groves Many groves were wiped out entirely Jamaica's north coast, which was one long grove, is a pitiful sight Coconuts used to be a profitable export crop but now there are hardly enough trees left standing to supply the demand of the local factories for coprathe dried coconut meat which is used to make cooking oil and soap Bananas, too, were hard hit, not only by the hurricanes but by leaf spot disease which renders the fruit unfit for export and finally kills the tree

The greatest employer of labor in the to lands has been the cane-sugar industry, par ticularly in the harvesting of the sugar-cane The cane was planted on large estates and harvested by hand by large numbers of canecutters It was ground and made into raw sugar molasses and rum in local mills and distilleries These products were sold abroad,

largely in the mother-countries Of course the people of the islands had to have something besides sugar to eat, but they grew very little of their own food A large part of what they are was shipped in from outside, especially rice, salt fish and meat This way of earning a living and of getting enough to eat is called a sugar economy The war upset this economy Many ships were used to supply the armed forces of the Allies Other ships were sunk by enemy submarines Since these ships could no longer bring in

supplies, the food shortage grew serious Now the question is, what is going to hapen when shipping is again available? Are the islands going to go back to their old sugar economy?

NEW PROBLEMS FOR THE ISLANDS SUGAR INDUSTRY

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There are certain indications that the sugar situation wilf be more complicated in the future than it was in the ofd days. In two years or less the Philippines and the Dutch Last Indies will be back in full production of sugar, and the beet sugar industry of Europe will also be back on its feet Probably the world will see the end of a sugar shortage by 1947 And then what? If too much sugar is produced Caribbean sugar will not bring a good price. This will mean suffering poverity and unemployment for thousands of families in the islands of the Caribbean. Too much sugar is what there will be unless there is some system of international control Here is some system of international control Here is a job for the Economic and Social Council of the United Nations Organization and it will be interesting to see how they handle it.

FISHERIES CAN BE MADE TO YIELD A BRTTER INCOME

On the brighter side of the ledger there are two industries which through research study and organization, may help the economy of the islands very much These are fisheries and tourist travel A great deal of research has been done on fisheries in the last two years Technical experts have surveyed the marine food resources and fishing methods of Jamaica British Honduras and the Ba hamas In reports to the local governments these experts have made recommendations for improved techniques in fishing and in handling the catch A boat was loaned by the United States Navy and fitted out with up to-date gear including otter trawls and purse seines An expert from the United States Fish and Wild Life Service and a British fishery expert spent several months aboard this boat in the Gulf of Paria and off the British Guiana coast and off the island of Tobago, studying marine life and devising improved methods of fishing for the natives

Sharks were the subject of a Caribbean wide study A pamphle in sumple language was published by the Anglo American Carib bean Commission telling the island boys what gear to use to eatch the sharks and how to prepare the skins liver oil fins teeth and meat for market Several thousand of these free pamphlets have been distributed through local governments also social selfare or game standard to the standard of t

The eastern Bahama study concret the waters of the Islands from Long Island to Muchoir Passage As a result a draed saft fish industry was started in a small way and has already found a market in the towns on the north coast of Hatti Studies are now being made of the Leeward Islands and the Saba Bank The latter is a large innef althou bank, a few miles to the westward of the Dutch Island of Saba Until this present

study ats fishery resources had been totally unexplored

Tourst travel has also been the subject of a Caribbean wide study. An elaborate report was published by the Anglo American Carib bean Commission in June 1945. This de scribed the principal sites which are or might be developed as fournst attractions in all of the Brush Duich Prench and United States islands and in Club. Hast it and the Domini stands in the Club. Hast it and the Domini prian of development. Its object is to building a tourist industry valled at \$50 0000 on a jear A conference of all agencies micrested in travel in the area was held late in 1945.

In short the most encouraging feature of the year in the Caribbean is the growing tendency of the people of each island to see beyond their own little spot of land Both the peoples and governments of each island are beginning to think a great deal more about all of the other islands They are getting together more and more to study and work out their common problems In 10.15 a second West Indian Conference was planned to be held in the immediate future probably in the United States Virgin Islands to be attended by representatives of all the island peoples. Every such meeting helps the scattered islands to understand each other and makes it easier for them to work to gether to solve their common problems



Courtesy Cuban Na snal Tou at Comn sa on In Cohe and two-wheeled carts like this one carry the cut sugar-case from field to mill.

CENTRAL AMERICA

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THE five independent countries of Central America—Costa Rus — I Sabador Guaternala Henduras and Augaraus—nent to war against the Yan in December 1991 Store the Costa of the Costa of the Costa Store that the Costa of the Costa of the Store that the Costa of the Costa of the Lock with the Linted States and the other countries of the Western Hemsphere Thetook part in the Inter American Conference on the Problems of War and Peece held in Western (4) Gertranzy x 2 March 8 1993) Western (4) Gertranzy x 2 March 8 1993 Description of War and Peece held in Peece 1992 (1) Pee

As members of the United Nations the Central American countries sent delegates to the United Nations Conference for Interna tomal Organization which opened as In-Liance co or April 23 1945. They all supped the United Nations Organization charties about which we tell you in the article on the United Nations and World Peace.

and the state of t

The liberal opponents of Aguirre Salmas denounced his potentiment as "dectations" and fascist "some of them estal liberd is government newle in Goatemals Others of the control of the con

The country was thrown into an uproar

shorth before the election when the four candidates opposed to Aguirre Salinas with drew from the presidential race. The claimed that their supporters had been ter roursed in the provisional government, and that under the incremistances a fair election was impossible. When the election took place, therefore there was only one can'll date, General Castaneda Castro. Naturallis he was elected pris dent.

The provisional president, who had backed Castaneda Castro as ne have seen, claimed that the election had been perfectly fair life pointed out that the right index finger of each voter had been marked with indelible ink after he had crut his vote so that he would not be able to vote more than once But the liberals who had opposed the provi sional government observed that, whether voters cast one or ten ballots aniece the re suit would have freen the same since there was only one candulate. They also reminited the people that the president-elect had been minister of the interior in the old govern ment that had been overthrown in 1944 Would the cutteens of Fl Salvador be any

However, the new government proved 19 be a pleasant surprue One of the first acts of Castaneda Castro after taking office on March 1 was 10 declare a general annesty or pardon, for political offenses. He urgel political eviles to return home promising that they would not be niclested and that they would enjoy aff the rughts of efficiently in

better off than before?

As time went on it became clear that Castañeda Castro was determined to govern in the interest of all. A revolt against the government was started in July, but the cevolt was crushed

Guitemals had also passed through a period of ecolution in 1944. General force brow who had been president since 1941 had been forced to resign in July 28 in 11 Salvador the first provisional government to be established was overthrown, the government was then turned over to a junta er miling group of three men in December 1944 a national election tak place by Juan 19-6 Virsola a well known education.

was elected by a big majority

The month of March 1945 was a notable one in the history of Guatemala. It saw the inauguration of President Arevalo It also marked the adoption of a new and progres sive constitution which sought to pre ent one man rule and to make Guatemala a genuine democracy It provided that no president should succeed himself until he had been out of office for at least twelve years To keep the army from meddling in politics the constitution provided that no member of the armed forces was ever to be come a candidate for the presidency. It also gave women the vote and set up maximum working hours and minimum wage rates

In March, too there began a vigorous campaign to reduce the number of alliterates (An illiterate is a person who can not read or write a literate is one who can read and write) A law was passed in March providing that each literate Guatemalan between the ages of eighteen and sixty was to teach an illiterate person how to read and write This law was patterned after a Mexican law of August, 1014 It provided penalties for literate Guatemalans who took no part in

the campaign against ignorance There were no important political changes n the other countries of Central America President Tiburcio Carias Andino of Hondu ras and President Anastasio Somoza of Nica ragua have been in office for many years and

efforts to force them out They offer a good example of what is called continuismo in Spanish This word is used in speaking of national leaders who continue in office by having the constitution changed or hy hold mg government-controlled elections

As lor Costa Rica it has set an example of orderly and democratic government for many years. That record was marred somewhat in Cebruary 1945 when a series of anti government riots took place. These out breaks which were led by followers of ex-I resident Leon Cortes were put down by the government. The general public continued to one its hearty support to I resident Teodoro Picado Michalski

Under this president who was elected in February 1044 the government has been distributing to small farmers land that is not being used. Some of the land granted under this program was bought from large planta tion owners, some of it was taken from Ger man owners after Costa Rica declared war on Germany The land distribution program has increased the available supply of food crops and so has proved to be a valuable weapon in the fight against steadily increasing fiving costs

The project of combining all five Central American countries in a single federal union has often been proposed in the past. It was revised in May, 1945 when the presidents of Guatemala and El Salvador met in order to discuss plans for a union between their two





Children are taught to read lips and make ward gounds in this school for gest pupils in Hondaras

countres. In a statement issued alter the meeting the two presidents proposed first of all to remove all customs barners between El Salvador and Guatemals to create a single banking system and to permit free immigration from one country to the other Pobitical union would come later. The two countries would be plomed in a loose kind of federation in which each nation would keep its sovereight.

The two presidents made it clear that they looked upon the proposed union between El Salvador and Guatemala as only the first step in bringing about a vider union binding together all the countries of Central America. An official statement issued after the meeting said it was agreed to invite the heads of state and the people of the Central American republies to be it federation.

So far the proposed union between El Sal vador and Guatemia is still in the discussion stage, nor have the other countries of Cen iral America shown much interest in the matter. The prospects for a five state Cen iral American federation are not bright

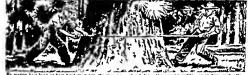
The region that we call Central America includes not only the five independent coun tries that we named above but also British Macduras, a relient of the Brush Empure Guatemiah has land claim to this ferritory at intervals though it has not pressed the matter so far In 1945 Guatemiah again set forth its claim to British Honduras in Article 1 of the new constitution

Great Britain points out that the present boundary between Guatemala and British Honduras was fixed by an agreement signed in 1859 and ratified by both countries but Guatemalans observe that in the agreement forced Britan promoted to Guatemala City Great Britan promoted to Guatemala City the capital of Guatemala Since the Britan has not but the road in question the 1859 agreement is no longer in force according to Guatemala The diugute has been carried on in a gentlemanly spirit. It should provide more years as no settlement is in a fet.





CO-OPERATION



We matter how long or how herd they try the men can not ent down the tree by pulling away from each other flut when they work together each one pulling in his turn the job is even done

By William C Lehmann

O OPERATION is a line word an active word. It means working togeth without co-operation our very homes our schools our churches, society itself could not east. Without a good measure of it there could be neither government business nor community life.

Our forfeithers knew its meaning well in the village communities that made up there life for thousands of years and in the frontier vettlements of early America. It broughts ucess to the Furopean guild exstem that bound together merchants master workmen and ordinary craftsmen in their work their days some peoples such as the Yun Indians of New Mexico and Arasona the Chineseand in many ways the people of Demmarl make co-operation a foundation stone of duly Iving

In the teening life of our modern cities and to a lesser extent also on our farms to-

day, co-operation his apparently come to be overshadowed by individual enterprise and competition. But we need only look at the working of any large business concern or a labor union or of the manufacturers association of our own home town to realize that even today we can not exist without a considerable measure of co-operation.

Spelled 'team work it expresses a combination of andradual effort fair play and working for a common goal most estable understood by every boy, and got 'Spelled' this world of ours can still be made a place in which all peoples can line and work happly together—this new world in which London and Moscow and Chungking are only a few boost journey from one another by air to rather in the fraction of a Second !

Co-operation as we have seen means working together. It stands for the sort of



Greenweh House

Children co operate to make brautiful music. effort in which each one of us plays an im portant part. A player on a school baseball or football team may not be a star but he is an important member of the team if he works for its good instead of for his personal glory. He is important when he hits a sacrifice bi nt and advances a runner from first to second base he is important when he takes out a would be tackler and thus makes pos sible a touchdown run Iust so in the life of the community and in the business of mak ing a I ving co-operation demands that each one should make the most of himself not for the sake of personal advancement but for the good of the community as a whole The reward of effort in a co-operative spirit is rich er because there is more to share and there are more to share it. In fact it is the very heart of free enterprise and the democratic way of hie

Co-operation may mean any free association between two or more persons or groups or communities working together wound a desired goal in a way they associated on The word has also come to mean and toward to treular kind of business activity in this people organize and own and control the business themselves in a kind of mutual self help

It may help us to understand co-operation better if we remember that there is always in the world about us a natural kind of working together. We may not have planned it and we may even be unconscoos of it yet without it none of us could live at all.

Exercise in a superstance is a superstance of the superstance in the superstance is a superstance in the superstance in the superstance is superstance.

Even in nature there is a web of life that binds individuals and kinds together Swarms flocks and herds instinctively stay

In the fife of men too there is much co operation that is scarcely at all the result of conscious planning

PRIMITIVE PEOPLE EARLY LEARNED THAT THEY MUST WORE TOGETHER

The most primitive men of whom we have any knowledge were always banded together in some kind of family or horde and later in a tribe for protection against weather wild beasts human enemies or hunger Among

primitive peoples today some will be built ng or fishing while others gather roots or berries or stratch he soil in rude agriculture and still others care fo the children 'let all work together to provide a living to protect their kind to win the favor of their gods And those who break the raths; who refuse to co operate will as a rule be severely punished

Our own forefathers lived in agricultural village communities. Here each family had its own strips of land its own cattle and its own harvest but the families worked their fields together and herded their cattle and sheep or goats in common pastures Their woodlots were open freely to all and their strips of land were re allotted from time to time so that all had an equal chance at the favored plots of ground They lived by com mon rules they all rushed to put out the fire in their neighbor's thatched cottage they played and sang and danced together on the village square they worshiped in the com mon church and when they died they were laid to rest in the ancestral 'God's acre

Today our villages have grown into towns and cities with thousands sometimes even milhous of people Our neighbors are so many that we do not even know most of them Instead of an occasional mill or smithy we have a complexated network of factories whole most of the property of the continuous together Au transports slip over Greenland or the North Fole to deliver their cargoes in what was once farraway China

But still there is co-operation between factory and field between the cotton grower, the textile mill and the shop on Main Street between the fruit and vegetable grower in California and the man who eats his break fast in New York or Boston or Montreal There is co-operation, too between factory owner and engineer and worker, between manufacturer and hanker and our local mer chant

But because most of our neighbors are so far away and our village community has really become a whole world community we have lost something of the old sense of fixing in a neighborhood Let co-operation is even more necessary than in the old days Modern business is an exchange of services among neighbors trade is still an exchange of goods

among neighbors Today our whole world is ranidly becoming one vast neighborhood again. Men are awakening anew to the meaning of co opera tion as a conscious, forward looking program and to the needs and opportunities for co operation in every realm both of our national

life and of our larger world community Let us look now at a number of ways in which such to operation has already been tried with marked success and with greater

promise for the future Such co-operation may be seen at its sim ple best among farmers and fruit growers in dry country where fields must be arrigated Crops can not be grown without water Wa

tapping the stream up the valley Expensive dams waterways and water gates must be built and ditches must be run through the fields of A B C and D If each tried to tan the stream himself or if A or B up the valley refused to allow water to be run through their waterways to the fields of C and D down the valley or if A took all the water for himself when there was little of it those farther down the valley would lose their crops and farming generally would become impossible By co operation they have learned to make the desert blossom like the

In industry we are fast learning that over work or underpay and poor conditions of work make for poor workmanship and there fore loss to the employer as well as poor liv ing for the worker And when workers unite to get equaf bargaining power with their em ployer expensive strikes and lockouts and loss of time and great bitterness may threat en ruin to both employer and workers But if the two sides come together and talk it over they often find that half of their wrongs have grown out of their fear one of another and half of the rest are not really wrongs but hardships neither side can do much to avoid while the remainder can best be adjusted by shop committees and other expressions of mutual confidence and co-on eration In fact labor unions and trade asso ciations may in this way themselves become instruments of co-ope ation between worker and employer instead of co-operative weap



crease the friendly spirit between their lends

Students of the American co-operate

ons of industrial warfare wasteful for both Every city has many agencies to help the underprivileged to provide lessure-time ac tixties (such as the \u03b1 or the Soutis camps) and to look after the health of the community 1 all go their own way there will be costly realizes and overlapping and waste of the community among while many important things are left undone. In most hands in community chests and councils of social agencies and the whole community benefits. This is community co-operation

And so with our churcher our chools the work of the Red Cross the Red Cross to Co-operation some with powtenment and and some without it some merely in the local community and some throughout the world—and the life of our communities is being made the richer by it

OUR BEST BOPE FOR PEACE IS IN CO-OPERATION

World War I and the far more destructive World War II and in between them the great depression have driven home the les son that between nations also there must be co-operation if we are not all to be destroyed by war. Many hopeful beginnings have been made

In 1930 shortly after the close of the first World War there came mus being a League of Nations, with beadquarters at Geneva Switzerland. This was perhaps the most promising experiment in world wide co-oper ation ever tried. Though it was unable to prevent the outbreak of World War II it accomplished many fine things.

Under the League there was a Permunent Court of International Justice with filtern judges representing many nations sitting in court at The Hague in Holland to settle disputes in the meaning of treates between nations and to interpret international law The United States took part in this court in this court.

Affiniated with the League was the International Labor Office with headquarters at Geneva. This organization accomplished great things in the creating of better standards of labor the study of unmingration the promoting of safety and health work also in opposing child labor and in many other ways. It brought labor groups together in peaceful to-operation

On page 316 we tell you of a fresh attempt to bring the people of the earth together in peaceful co-privation, under the head as The United Nations All men of good will be peaceful the willow must may succeed where the peaceful the willow may succeed where the world has learned that the old ways of set thing disputes between countries will no long er serve manhand but only destroy it Cooperation is more difficult than discession but the time seems to have come when the difficult tesson, will have to be learned

As early as the year 1910 there was set up the Carnegse I'ndowneat for International leace "to havien the abolition of international war and to promote co-operation between nations through strentific research through the holding of meetings and through education.

TOURG PROPIE CAN PROMOTE FRIENDSHIP AWONG WATIORS

One of its divisions is the Institute of International Education with beadquarters in New York City. Thus institute helps in the interchange of both students and teachers between the United States and other countries the world over Ey studying and teach ing and hving together, many people especially young people from many countries begin to understand each other better and then go borne and work for international un-

derstanding and co-operation

For several years the United States Department of State at Washington D. C. and
the National Educational Association a voluntary organization have joined hands in a
number of practical ways with similar agences in other countries in matters of educational co-operation. This is pointing the way
to an International Education office.

MAIL COES TO ALL PARTS OF THE WORLD BECAUSE BATIONS WORK TOGETHER

Except when war interferes tens of bil lions of pieces of mail are delivered all over the world every year without interference of national boundary lines. This is made possi hie by the co-operation of nearly all coun tries of the world in the International or Universal Postal Union which has operated successfulty since the first international post al convention was agreed upon by twenty one nations at Berne Switzerland, in 1874 In this convention the twenty one countries agreed to consider themselves a single terri tory for purposes of mail delivery Any dif ferences between nations in the matter of mail service are adjusted through this Postal Union French is the common tongue of the Unson



Rope for un era of peace through co-operation. Signing the United Metions Charter at Son Francisco

No greater honor can come to anvone in the field of sports than an Olympic cham pionship The Olympic Games are a form of international co operation in sports For over a thousand years such contests were held every four years in ancient Greece and if any of the Greek peoples were at war an armistice was called for the duration of the games In 1806 this idea was revived in Ath ens and since then there has been world wide participation in these modern Olympic Games They have been held every four years except in 1916 and again in 1940 and 1944 when war interfered One of the chief aims of such sports events is to build under

standing and good will among the nations Another splendid example of international co-operation is the Pan American Union with headquarters in Washington D C All of the twenty one republ cs in the Americas are represented in this un on and it is spon sored and supported by these governments themselves Its purpose is to develop closer commercial and intellectual relations and to promote international co-operation With

out it these nations probably could never have formed an almost sol d front against the Axis powers when the second World War threw nations into turmoil

Let us look now at co-operation in the nar



he becautul jedts of the Pan America: Building to Weshington D. C. The Union under 95 feets of the Union under 95 feet with Union 1892 to 1892



People String in this fire apartment bouse own it together Sharing the coals they are able to have a better home at less money then if they but a parete base a

rower sense of co-operatives and the cooperative movement

Consumers co-operatives are the most important form of this movement. They are first of all businesses like any other businesses except that they are organized and owned and controlled by the patrons they are intended mainly to serve. They have one aim— —10 serve consumer needs. (Consumer means user. When you buy a load of bread to eat or a school notebook or a penetl or to eat or a school notebook or a penetl or

a new suit. Jou are a consumer? A group of people usually neighbors or workers in a certain factory or members of a local clutter. Auf get to getter and set up a grocery store a gasoline station a general merchanistic of raim implement or feed store to serve their own needs. They put in some time the store of the store carm ings or dividends in the business and the mustally seems of the store carm ings or dividends in the business to by

They maintain high standards of service to the consumer and sell only for cash and at about the prevailing market price. If a buyer knows what the consumers' co-opera tives charge for a certain item he has a good idea of the fair price for this item.

A number of such local co-ops may form a legue with other co-ops and organize their own wholesale supply services and oth er services such as testing for high standards and carrying on educational work. Often these wholesale co-operatives when they have grown sufficiently large and strops set up or purchase their own factores mills or bakeries, sometimes even farms or plants.

tions, oil wells and refineres. They may operate their own trucking and transportation services and even railway oil tanks and oil pipe lines and ocean liners. Later they may also set up their own credit or banking frichities.

They thus become not 'producers co-

eperatuse, but production and distribut may a well as my a well as my

loan associations farm loan associations

Not all are co-operatives in the strict sense Among the less known or less tried are co-operative housing projects and apartment houses rooming ho isse resturants and similar services group hospital and health insurance associations and co-operative hospitals book stores and library loss services laundries Juneral and undertaking services alundries Juneral and undertaking services of the laundries for the services of the laundries for the l

Credit co operatives are a form of consumer service. A man with only small say mgs and hittle or no life insurance to borrow upon often needs ready cash to pay doctor s bills to meet some pressing family need or even to get a better bargain in an author mobile he may need for his work. He can mobile to may need for his work. He can



Then many people pay a small sum each year lote of app tallization place These who fell III can have the set of can be heaplished to lillie or no extra cast et de care to extra cast of the plane for mutual benefit are repidly appreciate.

not borrow from hanks and sometimes not even from personal finance companies because he can not provide the security good business practice requires of these institu tions and he can not or Goes not want to borrow from friends or neighbors. As a rule he can turn only to pawnshops or certain loan offices where interest rates are usually very much higher than they appear to be on

the surface Credit unions are associations of people usually working in a single factory or mem bers of some organization or otherwise per sonally known to each other who put their sayings together and form a loan fund from which members may borrow The funds are well protected the loans are carefully made though risks are sometimes taken where the needs are great There are few if any sala nes or other expenses to pay Employers often provide space and clerical workers and other services without cost to such credit unions among their own employees. Interest rates rarely amount to more than 1 or 11/4 per cent per month often little more than 6 per cent per year There have been almost no losses or failures recorded Dividends to shareholders are strictly limited Like banks the credit unions operate under government control nearly half of those in the United

States under federal charters In a recent year there were about 4 000 such chartered credit unions in the United States and Canada with an estimated mem bership of 4 000 000 and an estimated busi

ness of about \$325 000 000 Finally there are producers co-operatives or producers marketing co-operatives These are usually groups of farmers dairymen cot ton-growers fruit growers or such who form

associations for the purpose first of all of marketing their products at the best price they can get and without paying middle men s commissions These associations also provide their members with many other serv

ices And just as consumers co operative take on wholesale and production and other activities so producers co-operatives often purchase co-operatively their own feed gaso line farm implements and so on and thus become consumers as well as producers co operatives

There are a few but only a few produc tion co-operatives that is associations op erating farms factories and the like co-oper aturely for sale on the general market

Then there are of course co operatives banded together in leagues going all the way from local and regional groups to nation wide and international organizations such as the Co operati e League in the United States and the International Co-operative All ance These help in many ways to pro

mote co operation They usually operate on the so called Rochdale principles These are open mem bership democratic control limited interest on capital dividends according to patron age neutrality in religion and politics sale for cash at market price constant ed ca

tion and continuous expansion

The beginnings of modern co-operatives are usually traced to a group of twenty e ght weavers in the little v llage of Rochdale in Lancashire England who formed the Equi table Society of Rochdale Pioneers in 1844 They ra sed \$140 to open the first co-op store to supply the r needs for food and clothing at far prices



Nurts Bro he s cc operative at) re

with many ups and downs and ever enlarge ing organizations all over the British Isles Later co-operatives became popular in the Scandinavian countries and the rest of Eu rope and in other continents as well Today there are 70 800 000 families in 30 countries buying about \$20 000 000 000 worth of goods and service a year through co-operatives In Great Britain over half of all fami lies belong to the co-operative movement one eighth of the nation's retail business one seventh of its food d stribution and one eleventh of the wholesale business is done by co-operatives The banking department of the wholesale society is equal to that of the fourth largest bank in England In Den mark 70 per cent of all livestock and farm products are marketed and 70 per cent of all meat packing is done by co operatives. In most European countries from one third to two thirds of all families are affected by co. operatives

In the United States and Canada the movement was slow to take root. Since about 1920 however farm marketing co-opera tives then oil and gasoline and feed purchas ing co-operatives and most recently general consumers co-operatives in town and coun try have increased by leaps and bounds un til in a recent year there vere in the United States more than 7 700 marketing co-op eratives with an estimated membership of 2 580 000 and an estimated business of \$3 180 000 000 and more than 2 700 purchas ers co-operatives with an estimated mem bersh p of 1 270 000 and a business of \$600 000 000 Among the service co-operatives there were 850 electricity distributing co operatives with an estimated membership of 1 210 000 and an estimated business of \$35 000 000 and 2 000 insurance associations with an estimated membersh p of 10 000 000 and an estimated business of \$185 000 000

Nearly alt co-operative associations carry on educational programs in the work of the particular organization They explain the principles of co operative business and co

operative community living Very many of them also engage in recreational and other fellowship activities

Co-operatives then are a modern expres sion of the co-operative spirit. Already as we have shown you this spirit has resulted in great gains to mankind Yet much remains to be done

For example in some communities pupils and teachers and parents-in fact the whole neighborhood-join in making the school a real community center Coileges (like Berea College and Antioch College) and university ties too have sometimes become centers of community progress Students and faculty and administrators co-operate in planning and managing the affairs of the school col lege (or university) and town work together for the common advantage of all If this spirit of wise co-operation between the edu cational institution and the community were more widespread great benefits would result

As we have pointed out group health and medical insurance programs have already proved successful They point the way to a much wider range of health services and health activities There is also plenty of op portunity for increased co operation in such fields as adult education play and other leisure time activities youth hostels ama teur dramatics and so on

Increased co-operation is also called for as the radio television and the airplane come into ever wider use There would be turnoil if every radio station were to adopt any wave-length it pleased or if air lines were to be set up in regions that already had far more than they needed

We know what great advances have al ready been made in the field of pure science because men and women have worked together without thought of self but for the good of mankind What a wonderful world this will be when all scientists whatever their country may be join harmoniously in the good fight against disease and pain and drudgery and povertyl



Decorating as a Career

By Helen M Needham

EVER since the dawn of history when man decorated the stone walls of his cave with drawings and paintings, he has been interested in the appearance of his home Modern man's desire to make his home attractive is as strong as that of his cave man ancestor. This desire has given rise to the fascinating business of interior decorating

Many decorators today have the delight ful task of making life more pleasant by cre orating is not only fun but profitable as well It is little wonder that thousands of men and women have chosen their life work in this absorbing field It is particularly appealing to women because it puts their special talents to the fullest possible use-their sense of style and beauty their joy in shopping and bringing together lovely and useful things for the home

Decorating is an ever changing profession Man has always liked to change his taste with the shifting trends of the times. In his



Learning to be an interior decerator is fun Using actual : learn to bring out the most pleasing contrasts among the ter









Reanlaisance chair den gan From left to right are an Italian Dante chair of the period of Logis XV and an English chair of Queen Ellit lien Dante chair a Spenish armchelr . Oueen Elirebeins time the Tuder period.

home-as in his politics-he has always seemed to say Off with the old and on with the new This truth about human nature is one of the reasons that so many trends have come and gone in the field of interior decora tion

It is possible to learn something about people just by studying their homes If we look in old magazines and books for in stance we may see pictures of the crowded rooms that matched the elaborate dress and sentimental viewpoint of men and women in Queen Victoria's day By way of contrast when we study the furniture built by the Shakers we see how its sturdiness and sim plicity reflect the sober values of their lives

In museums we may revel in the wonder ful variety of furnishings of bygone days We may see with our own eyes the kinds of chairs and benches that people used to sit on long ago the chests in which they stored their treasured linens the beds they slept in and tables of all sizes that they used in many ways As we marrel at the great beauty of woven tapestries we may remember that their original purpose was to hang on the walls of the very wealthy to keep out the drafts, long before there was such a thing as

central heating And gallery after gallery of paintings by great artists remind us that people of olden times liked to have beauty grace their homes just as much as the early cave men did Beauty as well as usefulness are the twin goals of the interior decorator today

An interior decorator is a creative artist Almost anyone can put furniture and rugs and lamps and curtains together in such a way that they will serve a need But a person who has not been trained as a decorator usu ally juggles together all the ideas he remem bers from the radio newspapers movies and magazines Such hit-or miss methods may or may not secure the right effect A skillful decorator on the other hand knows how to produce the exact effect that he would like to have

A decorator must have sound husiness judgment Only the decorator who is able to plan interiors within the client's budget will succeed

The aim of the interior decorator is to create the one background that will exactly suit the person for whom it was planned A task such as this can never be merely mechanical or cut and dried No two clents will he exactly able nor will their needs and













with receipt to 12 designed by the American Duncan Payle

tastes be alike Each will have ideas that are different from other people's and each will have different amounts of money to spend

Suppose that you are an interior decorator and have one chent who is food of simple modern design and another who prefers the warmth and rechness of old Spain These the wearmth was the chaeses of old Spain These the people would require quite different backgrounds I you should be in sympathy with their wishes and do your best to understand them.

In few occupations does the personal element enter as strongly as in interior decorating. The decorator must possess the ability to understand and handle people. This means that he must be able first of all to make people like him. He must be patient and fair. He must realize that in working with people here are unavoidable mustakes and unactive and the must be able to the strong with the people here are unavoidable mustakes and unactive the strong the strong with the stron

If you decide to embark on a career in interior decorating you should try to have the very finest training Ideally you should have from two to four years of college with a fine arts major followed by two or three years at one of the good art schools where excellent ourses in interior decoration are given As

in all professions the reputation and scholastic standing of the school are im portant. The more educational background and

general information you are able to acquire the better equipped you will be for your job The location of your art school is important Itshould

be near to art galleries museums industrial exhibits and established decorating centers

Travel is a most valuable supplement to a formal education. If your mind is alert and your eyes are open travel can teach you a great deal about the cultures and back grounds of other people.

To complete your formal education you will find it most advisable to serve an apprenticeship with an established decorator Such an apprenticeship will help you to determine the type of work you can do best

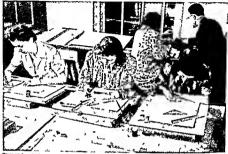
training secured a good education and good training and having served his apprentice having served having served his apprentice the young decorator may seek employ more to me of the many felds open to him lits first yob might be in the decorating department of one of the great department stores. After the newcomer has gained some experience he might become a decorator's shopper—a job that is great fun as well as evcoleted training. Lafer he might be add vanced to the position of assistant decorator and then decorator.

Experience will teach the young decorator whether his talents shine most brightly in styling bome furnishings designing testiles furniture and accessories planning displays or in the allied fieldsoil costume design stage settings and sales promotion projects

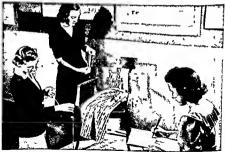
You should have years of successful expertence in the field before you limbs of opening a decorating shop of your own. In your own shop you will of course be in business for yourself and you must be sure that you have a good head for business if you want to very different thing from artistic training. In the course of your decorating work, you will oved a good deal of business knowledge but if you decorate or own shop you for you want you w



GRACIOUS ROOMS BEGIN WITH DRAWING



Enow of how to draw, with a good understanding of perspective to a valuable tool for the interfer decor Them students are designing rooms in perfect scale and will add fursion og details.



The liese of an old Freech chair with a lyre back Empires these father decorators. Two girls take its exact mescurements, while the other girl electhese a possible adaptation at its design for modern ase



New 10 k School of Inte or Deco at on A awag valsace is examined for its skilling workmanship Decorators must know both bow to design and how to make dreperles and slip covers

should take the time to make a special study of running and manazine a business

After you have had training and experience in interior decorating you might choose to become a designer or a consultant to man ufacturers. If magazine or newspaper work appeals to you you might write articles about your work or accept an editorial post

There is so much variety in the many branches of interior decration that the mind is constantly challenged and there is always an incentive for growth and achievement. The completion of a formal education in this identity is the state of t

\ capable decorator is able to read and understand blueprints and layouts and he should he able to draw them himself. If he has this skill he can make sure of achieving the exact effect be wants from the first to the last detail If he can do the actual drawing himself he will gain an un derstanding of scale line form and design which can be acquired in no other way Many of the problems of decoration are directly con cerned with architecture and a basic knowledge of this subject-traditional modern -is vital to the decorator

A decorator should know how to draw plans for struc tural changes in a house or in a part of a house He might wish to have cup boards bult into a kitchen or he might wish to turn two small rooms into one good sized room by removing the partition between Sometimes the addition of a fireplace will change the whole appearance of a room in such a case, a decorator should know whether or not it is practical to have a fire place made knowing how to make changes like these

to make changes like these is a part of the business of any skillful dec orator

Sometimes a decorator may be called upon to make sketches and plans for the manufacture of special p ecos of furniture. He should he able to superuse the making of each p eco so that it will turn out to be just what he ordered. The decorator may also create designs for fabries rings and accessories when he can not find what he wants on the market.

A good decorator may be asked to decorate almost every kind of place where man lives or works or seeks amusement—hotels yachts stores office build ags and theaters Or he may specialize it? in fikes on all types of home decoration from city apartments to continty estates

Interior decoration is one of the finest of careers that talented women can undertake and few other fields offer so many opport intuities for enthusiastic capable persons whether they are men or women If you become an interior decorator you will need to use all of your abilities all of your knowledge and all of your understanding



ECONOMICS IN THE WORLD'S LIFE

By Graeme O'Geran

Department of Economics Syracuse University

ECONOMICS is the practical science dealing with the satisfaction of human wants. The word economics comes from two ancient Greek words mean ng household pos sessions and managing. The study of eco nomics the study of our human wants and their satisfaction is based upon two funda mental truths. The first of these truths is that our wants are unlimited. We are somehow never fully satisfied No sooner is one want satisfied than another appears. Take your self for example At some time or other haven t you wanted say a new ball and bat for Christmas tell ng your parents that such a present would make you perfectly happy?
Then perhaps even before New Year a you found yourself thinking that you could really play good ball if only you had a new ball suit or a pair of sp ked shoes Well we are all that way always wanting something we do not base

The second great truth is that nature makes us struggle for most of the things we need or want Your father or mother must work in order to earn the money without to buy the clothes you wear the food on the control of the control of

From the earliest times man's chief concern all his life has been to supply his daily needs. As a result of this situigale to make a living our ancestors passed through several economic stages. Their passage from one stage to another was very gradual in some cases and more rapid in others.

Man lived in the first stage f r perhaps thousands of years. The people in some parts of the world remained in this condition much longer than did others. For example, some of the American Indians, were in this stage when the civilized white men first Innded in American In the first stage wants were met by taking fish from the likes and streams owned to agreement the stage and streams owned to agreement property as that he left today. Most of them had no permanent home and engaged in mether trade nor commerce Depending as they did entirely upon the raw materials of nature they would suffer a materials of nature they would suffer a first property of the stage of plenty and so, their like would be lived of plenty and so, their like would be lived I has scalled the Hunning and Tshing Stage

This is called the Hulling and Fishing Stage. With advancing cultization and with in creasing wants man gradually began to domesticate with animals. The fold Testameth describes a people in this economic stage surrounded by their flocks of sheep and herds of cattle. This is called the Pastoral Stage Pastoral means feeding grazing. The word pasture comes from the same Latin root.

In the next period the Agricultural Stage man began to own land and slaves and be learned how to raise a number of crops. So wealth began. The people of England for example, following the Aorman conquest of 1006 advanced rapidly, in the art of farming and some of them built up large agricultural estates.

With the growth of trade and commerce following the Crusades in the Middle Ages agriculture came to be somewhat less imported for the many sections of crobized Furore Men became skilled in making things with their hands and selling these things—cloth of various kinds shoes furniture and so on This prized is called the Handicraft Stage II some day you go to Fingland you will

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and that in London many of the ancient street pames remain indicating the trades of the people living there in the years of the Handicraft Stage For example you will see there such names as Mason's Avenue Iron monger's Row and Shoe Lane

You and I live in the Industrial Stage of the world's life. The Industrial Stage became firmly established as a result of the Indus trial Revolution which made it possible through many inventions, to do by machin ery work that had always been done by

human and animal labor

This revolution (or change) took place in England between 1750 and 1850 it spread to many parts of the civilized world including the United States Among the most im portant inventions were Hargreave's spinning senny, Cartwright a power loom Whitney's cotton gin to separate the seed from the raw cotton-and probably the most important of

all Watt's steam engine The results of these great inventions changed the way of living for millions and the change kent spreading and is still spread ing More things could be made at less labor and less cost The modern Factory System came into existence Trade and commerce were extended to far parts of the earth. Then men discovered that they could accomplish more by Division of Labor about which we shall soon speak. We said that economics is concerned with the satisfaction of human wants Things which satisfy these wants are

called Goods. The bread we eat the clothes we wear the air we breathe are all goods There are two kinds of goods Those which

exist in great quantity relative to the demand are called Tree Goods Air water and sun shine are examples of free goods Not only are they exceedingly useful they are neces sary to life itself. Yet under ordinary conditions we do not pay for them since they exist in abundance and may be had for the taking

Those goods which do not exist in suffi cient quantities to meet the demand are called F conomic Goods Unfortunately most of the things that satisfy our wants are of this kind, they are scarce and require effort to make them or money to pay for them

Leeful services even though they are not materials or things are clas ed as economic goods The pohceman the minister the operator of a bus, and the teacher, all render services which are just as much *conomic in character as those of the carpenter or shoe maker

What is wealth? We commonly talk of wealth as meaning riches the possession of much property A poor man is one who has few things or little wealth while a rich man is one who has many things or much wealth

But in economics we use the word without reference to quantity. In general we consider wealth is a group or collection of economic goods Wealth consists of all tangible things which satisfy human wants which can be transferred or exchanged and which because they are limited in supply have value in exchange

The study of economics is so much concerned with wealth that it is often defined though not quite truly as the science of wealth its production and distribution



American Indians lived in the Hanting and Fishing Stage longer than most peoples. Bure they bunt wild buffelo



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The second great truth is that nature makes us struggle for most of the things we need or want Your father or mother must work in order to earn the money with which to buy the clothes you wear the food you eat and the things with which you play When you grow up you too will have to work if you hope to satisfy your wants

From the earliest times man's chief con cern all his life has been to supply his daily needs As a result of this struggle to make a living our ancestors passed through several economic stages Their passage from one stage to another was very gradual in some cases and more rapid in others

Man lived in the first stage for perhaps thousands of years. The people in some parts of the world remained in this condition much

longer than did others. For example some of the American Indians were in this stage when the civilized white men first landed in America In the first stage wants were met by taking fish from the lakes and streams wild animals from the forests. The people owned no personal property as we think of it today Most of them had no permanent home and engaged in neither trade nor commerce, Depending as they did entirely upon the raw materials of nature they would suffer a period of starvation and then enjoy a period of plenty and so their life would be lived This is called the Hunting and Fish ng Stage

With advancing civilization and with in creasing wants man gradually began to do mesticate wild animals. The Old Testament describes a people in this economic stage surrounded by their flocks of sheep and herds of cattle This is called the Pastoral Stage Pastoral means feeding grazing The word pasture comes from the same Latin root

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To repeat wealth is a group of economic goods It is limited in supply transferable and useful in satisfying human desires. Study this definition carefully Sometimes very in turious things are produced and bought and sold. Often goods of inferior quality are made for a poor market Economics studies the best means of increasing the quantity of goods and commodities in their distribution It is the business of art and education to see that the wealth produced is good in kind and such as will make people happy com fortable and cultured. In the same way when we study engineering we are concerned solely with the making of machines and not with the quality of the goods the machine will be employed to manufacture. A good loom may be employed to weave a poor cloth but that is not the fault of the foom So economics when it deals with producing or exchanging commodities treats them all as wealth

A ENOWLEDGE OF THE LAWS OF ECONOMICS IS IMPORTANT IN MAKING A LIVING

It is new important if the greatest happenses is to be secured for the greatest number of people that we should understand the laws governing the production and distributions with the production of the pr

Getting a living was very easy to under stand in the past up to a boat is 50 years ago. Few machines had then been invested and free machines had then been invested and manufactured from benning to most past under the past of the past

SPECIALIZATION IN THE FIELD OF LABOR HAS BEEN DIVIDED INTO FOUR FORMS

Now all that has changed as a result of the Industrial Revolution. The machine takes the place of human labor in many steps And sance machines can usually work faster than human beings there is a great increase in the kinds and quantities of things produced. Things can be cheaply purchased which formerly were made at home—scap for instance. Workers specialize To this specialization the economist gives the name Division of Labor which has taken four lorus.

1 Occupational Division of Labor Long before the Industrial Revolution individuals and families began to specialize in particular occupations One family would concentrate on farning another on the making of shoes another on grinding grain for making flour another made clothes and so on Then an exchange of products took place so that everyone had all the necessities of life As a result of this occupational division of labor, things were not only made better but also made more cheaply since concentration on one job increases skill in that job and speed in getting it done Thus more articles can be made in a single day or week. This means a smaller cost for labor on each article

2 Drawow of Labor within an Industry Then occupations began to be broken down not parts especially after industry left the home and concentrated in afcorne For an stance in the etholiage of the state of the hats another in socks and still another in that another in socks and still others devoted themselves to making women adresses suits hats and so on. Likewese specialists ton developed in professions. For instance moviday, one doctor looks after our eyes another after our ears another sites our another after our ears another sites our another after our ears another site our another site our ears another site our ears another site our another site our ears another site our ears another site our another site our ears another site our ears another site our another site our ears another site our ears another site our another site our ears another site our ears

3 Specialization by Tash Still using the clothing industry as an example are find that a large number of workers are employed in the beaking of different parts of a mass and on does the measuring another take the control of the sewing another takes the lotton holes and others sew on the

4. Territorial Drixino of Labor When bears sundamery began to be used in Eng. land in the second half of the eighteenth century another change took place. Coal was accorded to the coal was a build lactories where coal was abundant so baild lactories where coal was abundant so reped in agraculture and bought iron coation are seen as graculture and bought iron coation are seen as a coal was abundant so the coal was abundant so the coal was abundant so that the lad outle of the coal was a bundant so reped in agraculture and bought iron coation are coal was a seen as a coal was a

Belfast in Northern Ireland made linens

because flax was grown near by In the United States, the steel industry developed in places near coal yet close enough to water ways so that iron ore could be brought cheanly to the coal for smelting. In Alabama

isfy the needs of its people without looking outside its borders (or the borders of its Allies)

Allies)
Adam Smith an Englishman laid the foundation for our modern study of economics His great book. The Wealth of





Tie He mann Collection The Agricultural Steps saw man turn to cultivating crops with tools aged as the crude plew shawn in this pictura

coal and from are found close together that is an ideal situation. Cotton mills are found in the southern states, where cotton is grown

5 International Di ision of Labor There is a division of labor not only among persons among trades and among districts but also among nations. This arises for exactly those reasons which cause different trades within a country to be carried on in different parts of it A country may specialize in an industry because of certain natural resources or cli mate China's silk industry grew for ex ample because the climate was just right for mulberry trees to thrive and sill-worms eat mulberry leaves The people of a country may develop a special skill and so an indus try will grow there-as, for instance watch making in Switzerland and lace making in Belgium

For these reasons the nations of the earth are becoming more and more dependent on each other. To encourage this speculiarition and the exchange of goods between countries two great meetings attended by representatives of many nations were beld in 1944. One was at Bretton Woods New Hampshire to make plans for post war trade and commerce and the other at Dumbarton Oaks. Virgina to high for a listing ocase.

All wise men know that specialization be tween nations is good only in time of peace In wartime each nation must strive to sat



Nations was published in 1776. It describes three advantages arising from the division of labor.

I The increase in dexterity and skill of each particular workman 2 the saving in time because a workman no longer has to



thing to another if the worker has to make the whole of an article or to employ different processes and materials there is necessarily much time wasted in laying down one job or one tool and taking up another and clearing up after one job and preparing for a different kind of anoth.

To illustrate how the division of labor leads to invention. Adam Smith told the following story of a boy who worked at a steam engine.

A boy was constantly employed to open and shut alternately the communication between the boiler and the cylinder according as the piston either ascended or descended

One of those boys who loved a play with his companions observed that by tying a string from the handle of the valve which opened this communication to another part of the machine the valve would open and shut without his assistance and leave him at hetry to divert himself with h s playfellows

One of the greatest improvements that has been made upon this machine since it was invented was in this manner the dis

Lb s y
Shoemaking in elden times

Shoemaking in eiden times was done by head Here a cabbiar (sheemaker) works at his trees

By Esting (inlossy New hold Amachine stitches shoes at impagn factory

pass from one job to another 3 the stimula tion of invention

As to the first of these every child has

seperance To become eyert in swimming or in playing the piano we must give much time to pract cing. The constant practice of a particular thing makes it become second nature. Thus the person devoted solely to one occupation is far more useful than if be were a jack-of all trades.

As to the saving of time in going from one

covery of a boy who wanted to save his own labor

Adam Smith is even more right on the point now than when he told this story Nowadays in great manufacturing establish ments there are mach nes to do almost every part of the work quickly and with a minimum of attention from the operator

Along with the great advantages we have seen resulting from the days on of labor there are some results that are far less de-

Γ 108 T

strable One of the chief of these is the monotony which comes with doing one par ticular task or watching a machine do one small task day after day and year after year, maybe for a lifetime

Such tedious work produces a deadening effect upon both mind and body and may cause an individual to lose interest in the job Such concentration can not help but destroy

pride in master workmanship

The remedy for the monotony is to be found in shorter hours of labor which give the individual a chance for recreation or for some form of individual work or hobby

It is true that hours of labor have in gen eral grown shorter as the machine age has grown older

NOW WEALTH IS CREATED

We are now ready to take a closer look at wealth. What is wealth? That has been defined as a collection of things limited in supply transferable and useful in satisfying human desires. We may go further and say that wealth to most of us means possess on of things over and above the amount needed for bare living from day to day. A country has part living from the following the country has potential or unused wealth it has stores of minerals or forests or other guits of nature that have not yet been worked.

Wealth is created through what the econ omist calls the process of production Production takes place when a commodity is shaped into a desired form taken to a place where it is wanted at a particular time and purchased by a consumer who believes it will satisfy some particular want. For example the wheat farmer raises the grain the miller changes it into a useful form-flour-the railroad carries the flour to a place where it is wanted when it is wanted while the mer chant performs the service of getting the flour into the hands of the baker or the housewife who converts it into bread for im mediate consumption All these people are producers So you see that anyone who makes a commodity more useful is a pro ducer. If in doubt as to whether any person is a producer or not just ask the question is someone willing to pay for the product he turns out or the service he renders? If the answer is yes then he is according to eco nomics a producer

From the beginning of time man has se cured a living from the soil For ages even to exist meant a continuous struggle Ex



An eportment house owner to a producer of a corvice

ustence was possible through the combined forces of two productine factory or agents—nature or land and human labor. With the long passing of time a new and very important factor in production appeared—capital Later as the Industrial Revolution spread from Europe to other parts of the world a fourth factor became very important To this new factor is given the name enterpriser. Now let us see the part played in production by each of these factors and why each is so important in modern economic life.

i Land or nature is that which provides its with standing from in which to work and play materials and forces. In the science of economics hand intens far more than just soil. It includes as used in this broad sense everything upon the earth as air every thing upon the earth as air every thing upon the earth as oil trees rivers and had not been as the sense of the se

2 Labor By labor as a factor of production as meant the application of our mental and physical powers to the materials and forces of nature in the creation of economic goods or wealth

Labor is usually considered as of two kinds physical and mental The physical ~3⁴5~

workers are likewise divided into two classes, the unskilled as the pick and shorel worker, and the skilled worker, as the shipbuilder, builer maker and automobile mechanic

There are also two groups of mental years. ers First, the routine worker, such as the average bookkeeper or store clerk. Second, there is that much smaller though very mm portant, group known as the mentire class of labor. To this class belong the expert ac countant the store menanger and your school principal as well as such men as Eli Whitney, who invented the cotton gin and Thomas Edison.

WEALTH TENDS TO GROW BY SAVING LABOR AND BY INCREASING ITS EFFECTIVENESS

It is not the amount of short we do when creates wealth but its effectiveness. Van is a small creature much weiker than many of the higher annuals, but his nucleis are more error to speak of labor as the source of wealth. The truth is that all the labor in the world would be of little use miles it was used in co-operation with the other lactor oil production—land, capital and management it uncreasing labor, but through saving labor uncreasing labor, but through saving labor

As long as man worked with his own hands or with the aid of a few simple tools and weapons he spent nearly the whole of his life in obtaining a scanty supply of food No matter how rich the territory he inhab ited he could not become wealthy or emov much comfort or culture. A striking example of this is the United States which supports about 140 000 000 people Not very long ago in the world a history, this territory with all its wonderful wealth of rich prairie land. timber, fine rivers natural ports and mag nificent stores of animals, was the home of a small number of men, most of whom hunted or fished or scratched for a scanty leaner and failed to create wealth because they did not know how to make the best of the natural gifts about them

THE INVENTIONS AND DISCOVERIES OF ALL HISTORY ARE THE WORK OF BUT A FEW MEN

But when labor is aided by the inventions and discoveries of cleer nine and exercised in a properly organized way, the possibilities of wealth production are almost unlimited. We of today are very fortunate we are the heirs of all the ages—the inheritors of the work, and genus of every great main and woman of every nation. We have a greater opportunity than ever to create mare wealth.

Now here is a remark table thing. The great mentions and ducon-terms in history has been the work of a few guited people. Even the include the small investions, the number of people to whom we are indebted for the modern means of making weelfth amounts to a tusy fraction of the full-inns who have leved or earth. If we are ever tempter, to be proud of using such inventions as the electric light, or the rathway term, or the steamboat, or the rathway, tet us tening of unservices that we did nothing to bring them about and that we can

at least use them melligently. We have seen how labor is divided among individuals, among trades, among territories and among nations in such a way as to get the best results. By organization we can make ordinary people as effective for many purposes as if they were very elever indeed while we can rare the value of all the people concerned, whether undividually elever or not.

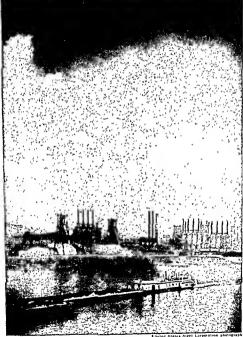
THE FRUIT OF ONE MAN'S INVESTIONS MAY ENABLE MANY MEN TO WORK MORE CLEVERLY

Suppose a man intents a tool. If he re mains the sole user of the tool, the value of his clever brain is confined to the one possessing it, himself. If however, he shares the secret of his tool with others, each one who has it at once becomes a clever worker, he use of a tool the could not have intented for himself. So men become, as it were, clever at second hand

3. Capital is produced wealth used in the production of other wealth. From this definition of can be seen that all capital is wealth but that all wealth is not capital. I and is wealth but certainly it is not capital. I and is wealth but certainly it is not capital. That is because land is not produced, it is a gift of nature. Capital is the result of human effort, requiring both waiting and sacrifice.

The following story may illustrate what we mean In early times a man might have kept has family fed by fishing all day long with hook and line But one day he might have taken time to hulld a net, while living ou half rations for the day Going out the next morning he would find that within the space of a few hours, by means of the net he could catch lar more fish than he had caught presiously by working all day Through sacrifice and waiting capital was created in the shape of a net. The farmer who puts aside a portion of one season's income in order to buy a new plow is creating capital in the very same way He buys the plow in the be-hef that spending his money for it will result in increased production

THE TERRITORIAL INFLUENCE IN INDUSTRY



The coal on these civer barges is mined in the area containing the steel mills thewn in the backgroun

Capital has vastly aided human progress We have seen how inventions have multiplied the powers of man making men even if not clever themselves the users of clever things It is important to understand however that if someone did not take the trouble to store up capital in the shape of machines and in struments (inventions) the inventions could not be used

Suppose someone invented method of extracting from shining white metal which it contains That deed be a tremendous serv

a chean clay the ալոսա would in ice to all

ventors improved upon the basic designs and millions of people every year ride on the radroads Many enjoy the inventions of a

het no matter how clever the ideas the railroad could not have been If some people had not stored up money to manufacture locomotives and trains to erect buildings to hold engines and cars when not working repair shops, tracks and ties and offices in which to control the whole undertaking These th pgs form the capital of the rulroad They embody the inventors ideas Once more we see that labor becomes fruitful when



mankind because aluminum is not only

beautiful but useful. Such an invention would make a very great difference to the powers of men and we could employ aluminum for a thousand new purposes However the new process could not be used unless somebody found the means to set up the inventor's clever machinery Sorreone must find the capital to utilize the new invention or the

invention does no good Let us consider the railroad that passes through the city or town in which you live A train is a marvelous thing though most of us are so familiar with trains that we feel no astonishment at seeing a great locomotive drawing a long procession of cars over the rails A number of clever brains thought out the ideas which are used in making a modern train Stephenson invented the railway en gine Westinghouse invented means of check ing the speed of a train by air brakes Pullman gave us the modern dining and sleeping cars Perhaps a hundred other in capital makes it possible to put inventions to

The Estamos sledge his dogs his cance his knife are his humble capital or stock These are the result of his careful saving and if he did not thus save he would perish The principle is the same in civilized, commit tuties We have learned to exchange goods with each other by means of money By money we measure the value of things by a common standard and money enables civi lized men to save up work in a convenient way Money acts as a storer of value Instead of saving up hats if we make hats-or auto mobiles if we produce automobiles we can save up money The money we can either use ourselves or lend to others to establish stocks of capital with which to use inventions and to enable persons to be usefully employed in working on inventions

Thus seeing becomes very important for without it all the clever inventions of ma chines and appliances would be useless It would have been in vam for Watt or Stephenson to invent the locomotive if people had not been found willing to lend money to make enough engines to run a railroad It would have been in vam for men to m vent radoo if enterprising and saving people had not come forward to put their money into broadcasting stations and equipment, through which programs are brought into vour home, and may reach every corner of the world Now we see clearly what capital is It is a stock of produced goods resulting from saving and if no one saved, there could be no capital

The person who saves and owns capital is sometimes called a capitalist He may be either a man who has saved to form a busi ness which he himself will organ ze or may be one who, having nothing to do with the business himself, has lent the money re ourred to huy the machinery, comment and that production might be properly carried on The enterpriser assumes the risks for the success or failure of the business He must make the decisions as to the amounts of land labor and capital necessary in a given plant or influstry.

or industry

This co-ordination of factors may be more clearly understood by studying a large cor poration, as for example a great telephone company. The wires switchboards and build image represent the capital The land provides the space for buildings and equipment. The managers linemen and operators represent the labor factor. The stockholders and their chosen officers constitute the enterprisers upon whom the final success of the mdustry rests. They are the ones who receive what profits are made, and they are the people-who must shoulder any losses.

This illustration should make it clear that



As automobile assembly line illustrates the spe lattration by task method. A man does only one particular job

raw materials needed to run the business

4 The enterpriser is the fourth factor of production Refore the Industrial Revolution the factors of production were not separately owned One man owned the land and promided the labor and the capital in carry on his business. Most of what a family consumed was produced within the bone. Problems of labor and capital were absent.

However, with the coming of machinery, one person came to have labor to sell, an other land to rent, and still another capital to invest. These factors were unorganized until the enterpriser, or business man as somed the task of unifying them in order

tant than any of the others. No industry can carry on without the combined factors working together smoothly and in proper pro portions. Any attempt to place greater importance upon one factor, as for example, capital, or falso, mould far about as difficult as to try to determine which cutting edge of a pair of sensors does the cutting or which lee of a time beyond story to most important to the contract of the contract of the contract of the contract of the cutting of the contract of the cutting of which lee of a time beyond story in most important on the contract of the cutting of o

As we have discovered, the enterpriser is a man with imagination He recognizes a business opportunity neglected by others He may be a Ford who first saw the importance of a low pirced automobile, a Firestone who developed the rubber industry, a Woolworth, who recognized the opportunities in five and ten-cent stores or perhaps your father who was the first to sense the need in your home town for mother bank a new store or a particular manufacturing plant.

THE BUSINESS USIT MAY HE SOLD OWNER SHIP PARTIERSHIP OR A COMPOSATION

No matter what the brld of activity the enterpriser is successful if he succeeds upon-ducing a commodity of rendering a service for which the people are willing, to pay a price high end ugh to return a printfe life is the one who organizes the productive factors into what the com instruction is business unit which has as its purpose the mixing of profit through the unfortent of wealth.

The business unit may take any one of three forms (1) the sole proprietorship (2) the partnership or (3) the corporation

i The tote proportion this exists when one person reconsess mannes and takes tull repended to for the success or failure of the business. He must provide the found and the capital have the labor and direct all the positive operations by far the present numbers of persons by failure of the business of the person of the p

SOLE PROPRIETORSHIP IS POPULAR RECAUSE IN THIS CASE A MAN IS HIS OWN ROSS

The very fact that the sole proprietorship is easy to organize has made it popular There are no complicated legal requirements to be fulfilled or payment of heavy fees to the state. The sole proprietor also knows that the hurder he works the more he whilely to earn and that all the earnings go to him There are no partners or stockholders with whom he must share his earnings. Finally there is no red type connected with the opera tion of the bisiness Suppose for example, one of your neighbors owns ami operates the leading clothing store for men in your community. He is perfectly free to buy as large or as small a supply of suits or shirts or ties as he wishes. He may spend money for advertising as he thinks best extend credit to customers or require cash open and close the store at will and even go out of business solely on the basis of his own rudement. In short he is his own boss

He does however face some serious dis advintages. In case the business fails he is held liable for all the debts. All his personal savings and possessions may be taken over to pay rent and wager that are owed and for the merchandise he has hought from the wholesslere. Another disadvantage is the difficulty of getting together large amounts of capital Barely can a business man by him self-secure subnered funds to enter business and large scale. This may prove a great handleyin when competition it, been of in periods of difference when receives the provide short fact falls off and not enough money, is comming in to meet his current costs of stanger in business.

2 The partnership A partnership evets when two or more persons by mutual agree ment organize manage and assume the risks of business I its customary, for those forming a partnership to draw up a written agreement setting forth the terms upon which the business will be run the amount of money or capital each will just lind to add how the future profits are to be divided up among the partners.

ROTH MEMBERS OF A PARTNERSHIP ARE RE SPONSIBLE OF THE EVERT OF FAILURE

This type of business unit has certain adaniases one the single proprietorship. In start with it is easier to get the necessary capital. Where two or more business menjoin together in a business undertaking theare usually able to pool a much larger sum of money for business purposes than could addoptoponed. There is an included addoptoponed the proprietor of the proprietors of the proprietor of the proprietors of the abilities and judgment. You know the old saving. The heads are belief than one?

saying. Two hears are deter than was the greatest drawback to the formation of a partnership appears when such a business returner has Them each one of the total has been as the partnership in case the other partners are not able to assume their share of the debt. This could of course completely run a person and place on his shoulders a debt which could prove a lifelong burden The partnership is popular as a form of the properties of the properties of the properties of the partnership is propular as a form of the partnership is propular to the partnership is partne

business organization with small merchan dising firms in the trades and among doctors and lawers. The next time you go domition look at the signs above the shops and offices you pass. No doubt you will be surprised at the number which read something like this. Smith and Smith Hardware Store. Jones and Brown Grocery or Graham and High Lawyers.

3 The corporation Most large businesses

and many small ones prefer to organize as occ corporations A corporation is an imaginary or artificial person created by law for some particular purpose. That is under the law the corporation has the same rights and pravileges as does an individual. The persons who own the business are not the corporation but merely represent this legally created individual, and carry out the rules and regula tions which the state grants the corporation at the time of its creation. The privileges are granted in the charter which is received from the state in which the business is more porated.

The corporation raises money for organizing and carrying on a business in two ways First, through the sale of stock which is a share or interest in the corporation If for example, your father should buy a share of stock in the telephone company, or a local bank or factory, he would receive a receipt for the money, he had The is recent would be

ROWN AND JONES

terest at regular intervals usually twice a year Most large corporations at some time or other use this method in order to raise ad dutional money for carrying on the business National governments also use this method to secute funds when more money is needed to carry on the government than is raised by tares

The corporation form of business organization enjoys several distinct advantages the most important of which is limited liability. This means that if the business should fail



John Brown is the sale owner of the first husiness unit and a partner to the second. The ibird is a corporation

a piece of paper stating the number of shares your lather bought on a certiam date and bearing his name as owner Such a receipt is called a stock certificate. Ask your father if he owns such a certificate, if he does ask him to let you see what it looks like

When a corporation makes good profits a part of this money belongs to the owners of its stock certificates who are called stock holders. It is distributed to them according to the number of shares they own These distributed profits are called dividends. When a corporation is not making money, there are no profits and so there will be no dividends. If the corporation fasts the shares will be more hosting at all and the owners of the shares will lose all they have invested in them.

Many people do not wish to risk their avings in the purchase of stock. For them a much safer investment is offered in the form of bonds. A bond is a note of a corporation given in return for a loan of money, pledging to return the money at a stated future time, and also agreeing to pay a certain rate of in the loss to any stockholder is limited to the amount intrested He can not as in a partner ship be compelled to make additional pay ments in order to meet any outstanding debts Another advantage is to be found in the ability of the corporation to gather to gether much larger sums of money for organ izang and operating the business

An excellent illustration is provided by the American Telephone and Telepaph Company Its capital investment amounts to many millious of dollars. Yet to share in its profits a person need buy only one share in the of stock. This shows how a large number of people may each place a small amount of amoney are a congentation and so create a large capital found with which to do busness.

The major disadvantage of the corpora ton is that the holder of a share of its stock must assume the risk of losing what he paid for it This is the chance he takes Over and against this risk of course is the possibility that he may receive ever Junge profits. Unless a person can afford to lose his investment he should not purchase stock.

We have just seen how the arrangement of the factors of production in such a fashion as to make them furiful is a very important thing and not every one has the gift of happy arrangement. We owe a good deal to these enterprisers who can organize and put into

work the best processes and inventions Organization and invention between them

save work and in saving it set labor free to do other work. This is a most important economic truth. For its neglect we pay in powerty and distress.

Let us think of a hundred people working on an usland and entirely dependent on their own labor If the labor of all the hundred is needed to find enough food make the think of the control of the labor of the labor

But suppose elver ones among them in event good weapons with which to hund-weapons so effective that only flity people are needed to feed the hundred shanders. In that case the work of flity foodgetters is saved and therefore flity persons are set free the contractive of the saved and therefore flity person are set from the contractive that the saved and therefore flity being freed and set to work for our threshold the saved and the saved and the saved to the saved to the saved to the saved to the saved the saved to the

Suppose the fifty remaining food getters by further inventions become twents five. Then twenty five can produce the food needed by the hundred islanders and serily five are free to do other work. The islanders become richer because work has been sated.

IT IS ONLY BY SAYING WORK THAT WEALTH AND EMPLOYMENT CAN BE CREATED

This process of saimg labor is just as true in a great nation as on the little island we have imagined A nation can become richer only by means of organization and invention continuously setting labor free to do fresh work. That is why the idea of making work is a fallacy-a deceptive thing Sometimes workmen are tempted to think that if they spin out a piece of work or refuse to use a labor-saving machine they will make more work for others The very reverse is the truth. It is only by saving work by using inventions as freely as possible that we can make things better for other people. He who makes work in the sense of taking an un necessarily long time to produce a thing

makes poverty. He who saves work in the sense of prinducing as quickly as possible and as much as possible with the least amount of labor expended creates wealth and more employment.

TECHNICAL IMPROVEMENTS MAT CAUSE THEM PLOTMENT BUT IT IS USUALLY TEMPORART

It is quite true that a machine which save labor may throw men and women out of work for a time. This is sometimes called technological unemployment which means that people are unemploy ed through no fault of their own. Other work for them may not be found at once and this may cause on suderable suffering. This is especially true if inventions come very rapidly in old industries and no new industries are at once.

Fortunately technological unemployment is usually temporary. In the long run insentions open up new opportunities for workers not alone in manufacturing but in other oc cupations as well For example back in 1900 about one million persons were employed in jobs closely related to the horse and buggy However with the com ng of the automobile the carriage and wagon makers the local blacksmith harness maker and feed store owner were put out of business. These were examples of technological unemployment. But as a result of the rapid growth of the automobile husiness by 1938 those engaged in producing selling and servicing the automobile employed almost 6 500 000 persons Likewise throughout this entire period rapid technological strides were being made within the automobile industry itself Instead of destroying jobs they created many new ones. This is but one of many examples that you may discover to show that by the use of labor saving devices both wealth and em

ployment are increased Thus we have examined four things which we speak of as Land Labor Capital and the Enterpriser, the four chief factors in the pro-duction of Wealth Land as covering all the gifts of Nature which man may either use or neglect Labor, as covering all human ef fort Capital the saved stores without which our labor is in vain and the Enterpriser who gathers the other three factors together and puts them to work in the proper propot t one so that they may produce most effi ciently Because these factors of production have worked together so efficiently over the years the people of the United States and Canada have more wealth and a higher standard of living than those of almost any other country in the world



Troops of the 3rd Armored Division U S First Army to Cologno Germany Background Calogue Cathedral.

** EUROPE **

THE year 1945 marked the final 1 bera tion of Europe from nair role. The Germans had reached the height of their power in September 1942 when their troops stood before the Russian city of Stalingrad on the Volga River Vorway Denmark Bel gum Luxemburg the Netherlands France Poland Czechoslovakia Vagoolavia Gerece and Vustria lay prostrate at Germany's Ieet (Czechoslovakia and Austria had been occu pied before the beginning of World War II) Russia 5 § Juntion was deep-rate in 1942.

Haly Hungary, Bulgaria Rumania and Funhari were Germany a Oberlieri allies Of the neutral states "Spain and Portugal were facest countries and frendly to Germany. Democratic Swelen and Switzerland bermed in by the Axis were helpless. Eure (Ireland) was determ ned to have nothing to do with the war Flished with success the Natus openly beasted of the New Order that they would bring to Europe. By the beginning of 1945 Germany & hold over Europe had been broken Four of he all es—Haly Rumania Bulgaria and I'm Jiand—had been forcet to surrender The Russ ans had penetrated into Foland and Cechoslovakia in the east and I ugoslavia in the south British troops had occupied Greece. The Allies had diven the Germania back the valley of the Fo River in Italy and Large had been the Greece and Large had been and Large had been and Large had been the Greece and Large had been freed from the group of the Neibriand, had been freed from the group of the Neibriand.

Germany s cities had been pounded merclessly from the art by bugs feets of Amercan and British bombers. Large areas of British bombers. Large areas of In Tulins Germany's war industries had been battered ber transportation system had been seriously damaged Alteady, too German sool had been invaded. The See fried Line the man navi defensive batter THIS WAS
THE
IEGFRIED
LINE

in the west had been cracked at several points the great cities of Cologne and Aarben were in Allied hands

The Nars had launched a last desperate counter-offensive in December 1944. They had plunged through a weally held part of the All ted line and had advanced deep into Belgium and Luxenburg. But this fierce at tack had been stopped at Celles near the Wesse River. The Nazis had held up the All ied advance for a time but they had exhausted their own reserves irrently.

As 1935 opened German advance units were still deep to Belgum The Alles now brought up fresh reserves and overwhelming air power. By the middle of January the main troops, were fleeing eastward under a perfect hail of Allied fire to the shelter of the Stegfred Line.

The British and Americans now continued their invasion of western Cermany. By the first week in March *neral Allted armies had reached the west bank of the Rhine River The Germans began destroying the bridges across the river. It seemed certain that the Rhine would be a formidable barner.

A FAMOUS CROSSING—THE HINDENBURG BRIDGE AT REMACEN MARCH ! Yet it d d not hold the Allies back very

you On March 8 in American force crossed the river at Remagen over the Hindenburg Bridge wh ha a careless officer had failed to blow up The Germans rushed reserves to the Remagen area But in so do ng they weak ened their defenses elsewhere along the river

On March 24 the British Second Army and the American Armh Army succeeded in crossing the Ikh ne at a considerable distance from Remagen. The All es now launched a Bittskrey or lightning war—a type of cam pages that the Nauss had introduced in Po laud in 1939. It was a Bittskrey in which planes tanks and infantry all played an important part. By the first of April All ed columns had plunged deep into Cermany.

In the mestime the Russans steam roller had ground ahead steadily in the east. By January 18 one of Russans armse had reached the German border province of Shery and the standard the German border province of Shery and the standard the Same Hussans Russans toops Lept up steady seems against the Hungarmax At last on January 20 Hungary Germany's last ally had to sgn an annexes.

The Russians continued to advance all Canad an A my O c seas phood Creatian transp driving aver desper into formany whose dit they rease at humor when they put as a sign of their awa on the far famed Signified Has

along the line from East Prussa to Hungary where fanatical German forces still kept up the struggle. One after another Germany's strongholds in the east were overcome. By the beginning of April the Russians had reached the mouth of the Order River they had advanced far into Silessa they had driven across western Hungary and they stood at the Austran border.

In the month of April Germany was crushed by repeated hammer blows from the east west and south The Russians maded Austria and captured Lienna on April 23. A week later they fought their was into the heart of Berlin gradually overcoming the

stubborn reastance of the defenders.

American tanks reached the Elbe River only seventy miles from Berlin on April 1s. The famous Thind Army under General Pat ton entered Germany on the 18th cutting Germany in too One by German city after another—Hanover Weimar Leipag Stutt gard Breinen Ulunch. I follow the American Charles of the American

The Allies launched an offensive in north ern Italy on April 9 and by the end of the month the Germans in that area were in full retreat They had to abandon Verona Genox Villan and benoe At this moment of Allied tramping the former Italian dictor Bento Mussolim was captured by Italian guerrulas He was put to death on April 8 in the village of Dongo on beautiful Lake Come Few people mourned this boastful man who had brought disaster to his native land

On Vay 1 the German radio at Hamburg solemnly amounced the death of 4dolf Hit let 'tcoording to this broadcast the German dictator had ded in h s capital city of Ber Inb brasely leading his troops. Viany people refused to belees this report it was rumored that Hitler had fled—perhaps to Spain per bags to I orusal perhaps to some place of refuge in the Viesticin Hemisphore I teally hand.

Berlin fell to the Russans at last on May 2 On the same day the German armer in northern Italy and southern Austria—a total of a million mem—gave up the fight. Two days later the British accepted the surrender of the German troops in northwestern Ger the German troops in northwestern Ger Lishands Finally, on Vlay 8 Admiral Doenitz who had succeeded Hitler signed the terms of definite surrender officially end in resist ance throughout Germany V E Day—the



Canad an Army Ove sees plu

With this parrender of Wageningen, Holland the Cormann by western Hylland capitalated to the Cauedings



day of victory in Europe-had come at last

The European continent had suffered ter ribly from six years of war. The countries that had been occupied by Germany and her allies had had a butter taste of the New Or der The Nazus had slaughtered great num bers of innocent people. Millions of men and women had been dragged from their homes and had been forced to work as slaves in Germany 8 war industries. The Germans had looted the occurred countries they had left inflation and want behind them The 1x13 countries had not escaped the

horrors of war Years of relentless bombing by British and American planes had left their mark so had the Allied invasions in the east and west Large areas of Berfm Hamburg Cologne Essen and other German cities lay in ruins Italy Hungary Bulgaria and Finland also bore the marks of Albed air raids and artillery fire The industries and transportation systems of all the Axis countries had been hard bit

There was great political confusion too. in Europe as the war came to an end The Allies had not adopted a uniform policy that would apply in all the countries freed from

the \u213 Great Britain and the United States had agreed that the territors occupied by their troops should first be ruled by a British American military body called the Miled Military Government (AMG) As soon as possible the civil administration was to be turned over to a provisional national government in each country

Russia was not represented on the AMG she introduced her own policy in the terri tories conquered by her armies To be sure in some of the countries occupied by Albed troops there were Allied Control Commissions on which all the principal allies were represented But it was a common complaint that these commissions did everything but control

Governments favorable to the Russians were set up in Finland Bulgaria Ruminia and Hungary-all former partners of Ger many -as well as in I bland Czechoslovakia and Jugoslavia which had been conquered by the Vazis Some of these governments were dominated by Communists who did not represent a majority of the population

Even before the coming of V E Day, dis agreements had arisen between Russia and

her allies over these governments. Russia s. allies complained that she had disregarded the rights of the Polish and Yugoslav pov ernments-in exile which had directed the fight against the Axis from London They protested against Russia's policy of prevent ing her allies from finding out what was going on in the countries that had been oc cupied by Red Army troops

For her part Russia pointed out that all had not gone well in some of the countries occupied by Great Britain and the United States In Italy the occupation authorities refused to let the Italians set up a republic British troops had been employed to put down tevolts in Greece and Belgium. The Russians complained that people's movements in these countries had been crushed and that her allies had favored conservative groups

Several months before the end of the war in Europe, President Roosevelt of the United States Prime Minister Churchill of Great Britain and Premier Stalin of Russia met near Yalta in Russia's Crimean Peninsula Among other things they discussed the grow ing misunderstandings between Russia and her allies. In a statement issued on February 12, 1945 the three leaders announced that they had agreed to adopt a unified policy in

They discussed rather vacuely the trouble some matter of Allied control in the coun tries that had already been occupied But they set forth in considerable detail their plan for the administration of Germany after her surrender. The country was to be divided up into several zones or districts and these would be occupied by the principal Allied powers The Allies would break up the Ger man general staff abolish the Nazi party punish war criminals and remove or destroy all industrial equipment that could be used for war production

The results of the Crimea Conference en couraged the Allied peoples, for it seemed to show that the Allies had come to an agree ment at last V E Day came the war in Eu rone was over. But the day of victory was darkened by continuing quarrels between the Allies Great Britain and the United States were still not satisfied with developments in Rumania, Bulgaria Hungary and Yugo



S enal Corpe photos

friendly fashles Below he Big Three at Petudam Germany Abever Stalls Treman and Churchill antic in friendly fashlen Believ Thing's back is furned toward the camera, Churchill and his aldes are at the left Stalls is posted at the right,



B 1 th Informs on Serv cea Prime Minister Atties answarces Japas a serrender slavia which the Russians dominated Russia objected to the Allied policy in Italy and Greece

On July 17. President Truman, Premier Stalin and Prime Minister Churchilt met at Potsdam near Berlin and began a new series of conferences Churchill was replaced on July 28 by the new British prime minister Clement R Attlee On August 2 Truman Stalin and Attlee issued a joint statement, which was called the Potsdam Declaration

The decharation outlined a general polocy for the handling of the German problem fol lowing pretty closely the plan already presented at the Crimea Conference R dealt in far less detail with the other occupied counties. It expressed the pious hope that Allied newspaper men would be permitted to see what was happening in Rumana Hungary. Bulgaria and inland

Bulgara and Finland
Misunderstandings between Russia and
her albies continued Some statesmen thought
hat this was because no official peace trea
uses had as yet been signed Therefore on
Systember It 1943 a Council of Fore gn
Haustern representing the United States
Systember and China
ment as Lundon in order its and China
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humary peace terms The Goursi of For
earn Ministers accomplished nothing practi
cal Indeed it appeared to have caused
butterness among the Allies

Another effort was made to bring them together in December 1045 when Secretary of State Byrnes of the United States, For elen Minister Molotoff of Russia and For eign Secretary Bevin of Great Britain met in Moscow At this conference it was agreed that the Big Three-the United States. Great Britain and Russia-would draw up peace treaties with Italy Rumania Bul garia Hungary and Finland They would then submit these treaties to a peace con ference that would include all the powers that had fought on the Allied side The Mos cow meeting represented a step forward Let at the year 1945 drew to its close there was still no unified policy for the settlement of Europe's problems

IN MANY COUNTRIES THERR WERE IMPORTANT POLITICAL CHANGES

Yet the countries of Europe did not mark time in 1945 or patiently wait for the All es to become truly allied There were important political developments in almost every one of these countries. Let us hriefly survey these developments.

Few nations suffered more in the war than Russia none came out of it with greater prestage. The sovet system of government had triumphantly stood the test of war De spite the destruction coused by the man in vasion, the Russian people faced the future with confidence. They were enhusiastic about a new fuelyear plan for 1964-1950-aplan intended to create a greater industrial Sowet Umon than existed before the war.

THE LABOUR PARTY CAME INTO POWER IN GREAT BRITAIN

Great Britan underwent a major political change in 1945. On July 5 the country held its first general election since 1935. The Britanh votes went to the politic on that day to select the members of a new Parlament The Labour party won an overwhelming v.c. tory in the elections oblaming a majority of the Seats in Parlament Firm Almster first and them offices on Minds of the Seats in Parlament Firm Almster 1940 resigned and been offices of the Seats of the S

of the Opposition to the Government
The new government announced plans to
nationalize (set up government ownership
over) certain middstries which are of vital
importance to the country as a whole These
include the iron steel coal and electric in
dustries The Bank of England was also to

be nationalized Other industries were to be permitted to go on under private ownership.

The nationalization program proceeded

The nationalization program proceeded slowly in 1945 A bill to nationalize the Bank of England passed the House of Commons in October, but the hank was still in the hands of its owners at the end of the Jear. There were tarous reasons for the Labour Government's slowness in pushing the socialization of Great Bitain For one thing the country was exhausted after six years of total war, and it was feared that too rapid socialization might bring about a crisis

Then, too, the British faced many difficulties abroad There was trouble with Inoba, which sought immediate independence, and in Palestine, where Jews and Arabs were in conflict British troops were called on to Intervene in the Netherlands East Index, French Indo-China, Syria and Lebanon (See Asas.) In general the Labour Government carried on the policy of the conservatine government of the past—chast is, it upheld the interests of the British Empire throughout the world

France, which had surrendered to Ger

recover her former position as one of Europe's Inermost countiers General Charles de Gaulle, who had never given up the fight against the Axis, had helped to set up a Provisional French Government on August 15 1044. Lader De Gaulles inspiring feed reship this government sought to bring wide support. Jet only frenchmen critic used it because it had not been put in of fee by the vote of the people.

On October 21, 1945, the voters of France had their day at last. They soled over whelmingly to create a National Constituent Assembly, which would draw up a new constitution. The three most unportant groups in the Assembly were the Communists, who formed the largest single groups and the Assembly were the Communists, who formed the largest single groups the Morenton a new party, made up of liberal Catholics These three groups formed a co-alting half-how contril over the Assembly.

The Assembly unanimously elected General de Gaulle president of a provisional government that was to serve for a period of seven months. During this time a new constitution would be drawn up. The nation would then an in the polls area, in order to



Serving an INSC all places

The coyal family group the crowds that gethered to wolcome Ring Machon VII on his setuen in Borway on Fance I Late to right; process Artist Crown Princes Markin Prince Markin, Princess Pagellid Crown Prince Clar

nut

accept or reject the constitution

The French took steps an 1941 to pussels those of their leaders who had oarded with the centry Marshall Henri I hilppe Petam head of the Vshy French Government which had been set up after I rance surreder was sentenced to death for treason (intelligence with the enemy) on August 15 In twee of his age the eventneer was commuted to life imprisonment Pierre Laval former premet of the Vshy Government also received the death penalty, and he was about Or Corbor 1 v, 1 number of other disposal frenchmen neer senence I to death or neet condemned to long terms of imprison ones of imprison ones of the present of the prese

GOVERNMENTS IN EXILE AND WHAT BECAME OF THEM

Some of the occupied constries went back to the old governments of the days before the war. Jung Haabon VII of Norway Queen Whilelman of the Netherlands and Grand Duchess Charlotte of Luxemburg had created by the conformation of the Norway of the Norway

The stutation was different in the other coccupied countries As the year 1945 opened the Pobla Gosterment in Eule found risell barred from its native Lind much of which had been recaptured from the Cemants by the Russians. The Gosterment in Evile which had it headquarters in London was based to be a support of the Control of February 1945 to try to bring the two opposing groups tegether

A NEW GOVERNMENT FOR POLAND WAS RECOGNIZED IN JULY

On June 23 a new Pobeh government was formed with Edward II Osubka Viorawski as preumer 11 consisted mainly of members of the Lub'in group though the Govern ment in Entle was also represented The new government was recognized on July 5 by Graff Britain and the United States and & has been in power ever since 1t has never been accepted by some members of the

former government in-evile who claim that the country's leaders are trying to set up a communist government on the Russian model.

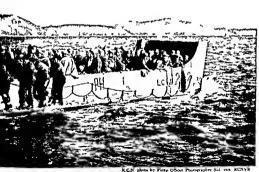
In h ugodasia too a government backed by Russia soon the day oner a government weale A communist guerrilla leader Tito, whose real name as Joseph Broz had won control over part of 1 ugodasia even in the He relieved to have anything to do with the Government on Fulle which acknowledged Joung King Lett Ha sits lawful sourcegon Irto a friend of Russia strengthened his ratle when the Russian strengthened his ratle when the Russians or the Russian strengthened his ratle when the Russians occupied in country

On November 11 1945 elections were held for representatives to a National Assembly of two houses. I to a nerview claimed that he was determined to set up a communistic form of government—a totalitar.

ian or as they put it a Titofaltarin government. They feared that the elections would not be fair and therefore they an nounced that they would stay away from the polls. Naturally Tito scandidates won and and thereafter his power was supreme. On November 19 the two houses of the Assembly approved a proclamation by Tito abolishing the monarchy and setting up a both they have been supported by the property of the they have been supported by the setting the support of the setting the

The Belgam Government in Exile returned to its native land on September 8 1944. king Leopold recognized by this government was a prisoner of the Naz's and of course would not be available until after the war Therefore the Belgam Parl ament chose Prince Charles Leopold's younger brother as regent to act in Leopold's place. Prenuer Hubert Pierlot of the Govern ment in Exile was very unpopular and be was forced to resign on February 7, 1945. He was succeeded by a Socialist Achille van Acker Van Acker ikke many other Belg ans beld that King Leopold had betrayed his country when he surrendered the Belgian army to the Germans on May 28, 1940. Van Acker declared that the country would never be willing to have the King return to the thome.

Leopold was freed from the Germans in the early days of May 1945. He delayed it is never to Belgum but announced that he still considered in mself to be the country rightful ruler. Public op 0 on was against him On July 17 1945 the Belguan Chamber of Deputies barred the King from returning the throne without Parl aments permis



A leading craft from the Canadian warraly H.M.C.S. Prince Beary active in the desperate civil war in Greece.





French Press and Information Service An olderly Franch women centing her first vate The women of France wen the suffrage in 1945 sion Prince Charles is continuing to serve

as regent The Greek Government-in Exile returned to power in Greece in November, 1044. when the British occupied the country King George II, however, agreed not to come back

to vote on the question of keeping the monarch, In December, 1944, fighting broke out between the Government and the radical ELAS proun. The British arranged for a truce, and a compromise government was set up with Archbishop Damaskinos as regent

Unrest continued throughout 10.15 The country had suffered terribly in the war, and conditions improved but little with the coming of peace. One premier after another gave up the attempt to form a stable government The regent himself was so disheartened that he resigned in November but he was per suaded to remain in office

Little Albania which was swallowed up by fascist Italy in April, 1939, has become a republic The United States, Great Britain and Russia agreed to recognize the Govern ment on condition that elections for a Constituent Assembly should be 'on a free basis" In the elections, held on December 2 1945, the Democratic Front party of Premier Enver Hoxha won all eighty-two seats in the Assembly Hoxha is a national hero He was a leader of the Albaman under ground when the country was under the rule of Italy

Of all the European nations that fought on the Axis side, none was held to be more



After war-work! Here we not workness rebuilding & war suised windort near the city of Mantes in France r 127 T

guity than Germany which had started the war in September, ross and which had been guity of unspeakable crimes against hu mainty. The Allies were prepared to occupy the country for years if necessary to make sure that mazem would be destroyed and that Germany would never grann be able to threaten the peace of the world. In accordance with the plan suggested at

the Crimea Conference Germany was occupied by the United Stitts Great Birstain Russia and France each taking over a definite zone. The commanders of the Nited Control Council which had its headquiriers in Berlin. All problems concerning Berlin and the country as a whole were dealt with by the Council a unarimous vote of the four members was required for every decresson.

The zone system did not work versmoothly Fach zone became more or fess isolated from the others and this made it difficult for the occupation authorities to set up efficient central over the country, as a whole There was no generally accepted plant whole There was no generally accepted plant to the control of the contro

THE PUNISHMENT OF MAZE WAR CRIMINALS

Yet in spite of the difficulties in oberd in the occupation of Germany the Milles and definite progress in carrying out the previsions of the Cirmea and Jostain conferences Various steps were taken to punsh the native art rather than await trial for their crimes. American a very trial to their crimes American await trial for their crimes American await trial for Goebbels the chief propagandss of the Nazis Hennica Humiler the chief of the Gestatip, or secret police and Robert Ley the head of the German Labor Front it is Gold Huller, also committed supersonant

PLOTTING AGAINST WORLD PEACE IS THE GREATEST OF ALL CRIMES

Other leading war criminals—twenty four in all—were indicted by the International War Crimes Tribunal and twenty of them were brought to trial at Nuremberg on November 20 1945. They included Hermann Goering second only to Hitler in the Nazi party, Rudolf Hess, deputy Nazi party

leader until 1941 Joachim von Ribbentrop foreign munister Field Marshal Wilhelm kertel chief of the German high command Grand Admiral Karl Dernitz commander of the Amyral Karl Dernitz commander of the Name of the Carl party. The detendants were accused of a wide variety of crimes from plotting against the peace of the world to the killing of helpless prisoners

The trial had not been completed by the end of 1945 and it seemed hely that it might last for months in the meantine a number of lesers German war criminals had been tried before military courts and had paud the penalty for their crimes They in cluded members of the German armed lorces and custians who had been guilty of crimes against Allied soldiers they also included a number of commandants and guards who had served in the infamous concentration camps

THE QUESTION OF CERMAN ASSETS

Progress was made in the matter of obtaining reversions from the German The Post of the Common the Common the October that Riscas and Poland were to receive reparations from the zone occupied by Russan troops The United States Great Britain and other countries were to take over German assets in the western zones of Germany Russia would also receive a certain amount of Perparations from these zones Representatives of eighteen nations need that amount of Perparations from these zones may at Parts in a conference that lasted for November 10. November 12 of the Perparations of the Theorem 12 of the Perparation from these zones when the Common assets in the western zones should be divided weeks in the west-

The tearing down of Germany's war in dustry went on at a steady pace. Many far torres which had manufactured guns am munition tanks and planes were blown up or were stripped of their equipment. However the question of just how much midistry will be left to Germany has not been de coded because the Allies have not brea able to arree on this troublesome matter.

CAN GERMANY LEARN TO UNDERSTAND THE MEANING OF DEMOCRACY!

The Nazı party has disappeared though them to people think that it has only been driven underground. The Allies hope by reducating the German people to prevent the Nazis from ever returning to power. The occupation authorities have removed many mazi teachers from positions of trust and in

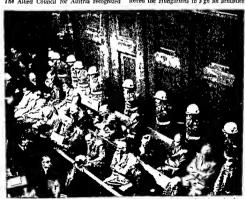
fluence and have replaced them with teachers of known democratic sympathies. They have also banned the use of the textbooks which glorified the Nazis and their exploits. The re education of the German people will prob ably be a slow affair Observers agree that most Germans have no sense of national guilt they regret only having lost the war

Austria annexed by the Germans in March 1018 has now won her freedom When the Russians occupied Austria in April 1945 they backed a new Austrian republic set up by a combination of Communists Social Democrats and Christian Socialists and headed by a Socialist Dr. karl Renner At first Great Britam and the United States refused to recognize this republic declaring that it was not truly repre sentative

In August 1945 the Alhes agreed to set up a four zone occupation system in Austria the occupying powers being the Umied States, Great Britain Russia and France The Allied Council for Austria recognized the Renner Covernment two months later It was desimed to remain in power for only one more month for it suffered a disastrous defeat in the November 25 elections for a National Assembly The conservative Cath olic People's party won eighty four seats the Social sts seventy six The Communists who had played an important part in the Renner Government obtained only five seats On December 4 Leopold Figl head of the Catholic People's party took over the post of chancellor (chief minister of state) replacing Renner

The small republic of Finland which fought Russ a twice in World War II and twice had to sue for peace has sought to co operate with its powerful Russian neighbor particularly since the liberal government of Premier Paasikivi came into power in April

1945 Hungary which had joined the Axis in November 1040 underwent several politi cal upheavals in 1945 After the Russians forced the Hungarians to s gn an armistice



Mani leaders on trial Naromberg Germany This tried sought to equalish expressive warfare as a crime T 129 7



Food from Angland on the way to bungry Europeanu.

in January 1945 a rad cal government was set up in which Communists were very powerful. But this government was over thrown as a result of the elections of No sember § 7945 when the conservative Small Holders party won a majority of the seats in Parliament. The United States and mental of Final and off Hungary because the people of these countries have had a chance to make their wishes felt in free elections.

Bulgaria and Rumania had not won rec pention by either the Americans or the Brit ish as 1945 came to an end In both coun tries radical governments had been set in

tries radical governments had been set up lady which was the first fascust sate and the chief partner of Germany in the Agas Jan fallen on evil days. The lost her African had been seen to the control of the control of his wall recover any of it. The country was lad waste in the course of almost two years of desperate fighting between the Allies and the Germans following the Itahan surrender Today there is widespread misery and surrender Today there is widespread misery and surrender among the people. Visuod in, who brought was cheely to blame pertains for the country's plight. Vany Italians however condemn with equal bitterness the royal house of Savov

Yet currously enough the house of Savoy still rules Victor Emmanuel III who came to the throne in 1700 still bears the tule of king of Italy but he has turned over the rule of 1700 still rule is Leitenant Gen eral of the Realm Italian inberals blame perhaps the Italians will be allowed to de ode for themselves what kind of govern ment they want.

And what of the neutral countries? As we have seen Switzerland and Sweden were democratic countries which were forced to remain neutral because of their gographical position. The neutral ty of fascist Spain was chiefly due perhaps to the fact that the civil war of 1936 1930 had left her exhausted Certainly the Spanish dictator General Francisco Franco made no secret of his sympathy with the Aus powers in the early days of the war.

ROW PRANCO TRIAD TO WIN THE APPROVAL

OF THE UNITED MATIONS

As the Allies gained the upper hand however Franco tred to win favor with the United Nations. He freed hundreds of American and British flyers who had been forced to land on Spanish soil and who had been interned. He forbade the export of war materials to Germany. He recalled a number of Spanish volunteers who had fought on the side of the Germany.

Franco also sought to appease the Allest by making his government more liberal On October 22 he took what he seemed to thal was a decisive step in this d rection. He issued a decree giving the Spanish people a bill of rights It was indeed a curious document in permitted Spaniards to do almost anything they wanted provided the dictator.

approved of what they did!
The Allies were not much impressed by
Franco a efforts to win their good will The
and again by responsible authorities in the
United States Great Britain Russ a and
France And yet Iranco continued to rule
The chief reason was that the Allies could
The United States and Great Britain agreed
with Russia and France that the Franco
Government was bad But they feared that
an open break with Franco might strengther
who would respond foreign interference

lottigal like Spain is a fasest country. Vet for hundreds of years it has been bound by ties of friendship with Great Britain It certainly helped the British and the other Allied countries greatly in the never ending fight against the German submarnes by granting the British a naval base in the Azores It is probable that Portugal took his step as a result of Allied pressure At any rate the country remarned neutral your proposed of the production of the produ

Eire has occupied a rather currous posstion for a number of years It is bound by certain ness to the British Commonwealth of Nations Yet it is no dominon like Canada or Australia but a sovereign independent state. It conducted justle like a sovereign independent state during the war remain ing strictly neutral

THE PUZZLING AMMOUNCEMENT MADE BY EAMON DE VALPRA

On July 17 1945 Frame Minister Eamon de Valera caused a stir in the Eure Pariss ment when he declared that Eure was a re public Several days later he explained that his country had become a republic on December 29 1937 when its new constitution went into effect. Did this mean that from now on Eure meant to throw off all ties with Great Britain? Not at all! Eure de Valera went on to say is still associated as a mai ter of external policy with the British Commonwealth of Nations

The political developments that we have been discussing are of great importance for upon them will depend the future of the European continent. Yet there are other problems which are even more vital to mill ons of people A particularly pressing one is that of providing relat—food clothing and housing—for the needy of many lands in 1945 the chaef burden of supplying relat fell upon the United Nations Rel et and Re labilitation Administration (UNIRA). A number of members of the United Nations

are taking part in the UNRRA program
Another problem is that of proading for
displaced persons that is refugees driven
from their homes and unable to return One
estimate that of Britania Royal Institute of
Foreign Affairs sest the number of displaced persons in Europe at twenty million
were forced; and the session of the control of the conwere forced in the control board Cerchoston-aks,
Slesia East Prussia and the eastern part of
Pomerania The displaced persons also in

clude Jewish vactums of the Nazis and great numbers of Russians Poles Belgians French Czechoslovals and Nugoslavs who were brought into Germany to toil like slaves in the fields or in war industries. The last of cating for these people and restoring them to a useful life will be one to tax the resources of the UNIRRA and other agencies

The story of Europe in 1943 is not a pleasant one. The continent has been freed from the nazi yoke but the most terrible war in the history of makind has left behind it unspeakable misery. Moreover quarrels among the victors have aroused earth that the Allies may lose the peace after having won the war at frightful cost

"The chief loope of the future lies in the United Nations Organization (UNO) the new league of nations to which many of the countries of Europe belong (See the United Nations). In 1945 the UNO existed only on paper the first meeting of its Assembly was not scheduled to take place until January to road. Will in continue to be a paper organ trace with the continue to the appear of the paper organ trace. The propers and proposed with the paper organ and indeed of the whole world, will depend upon the ability of men of good will to make the UNO really work."



Canad an Army O erseas photo Back who a they same from! Germans leaving Holland.



Simon Weissman

H AVE you ever heard your friend strike a wrong note on the piano when play ing a very familiar piece? Either you laughed or became annoyed Good musicians do not make such mistakes

Have you ever heard people use words that do not belong? Surely you noticed that tool Obce more either you laughed or he came amoyed. You in Piglish teacher insists more much more, exacting in their use of words For instance, the words force work power and energy are often mustsed by orth any people because their meaning is not really understood. In science each of these and can not be interchanced with the others.

The word "force appears very often in the study of physics There are many Linds of forces. The gravitational pull between the carth and your body when you are standing carth and you to body when you are standing to the standing the carthy of the carthy o

a body or changes of motion in that body When a brick is attached to a spring scale you will notice that the spring scale stretches a certain amount When two bricks are at tached the spring will stretch twice the amount and three bricks will stretch the spring three times as much Thus we can see that the gravitational attraction of the earth for the brick which is a force can be mean ured by measuring the amount of stretching which the force produces in a coiled spring Suppose that each of the bricks weighs two pounds Attach a string to one of them What would be the tension or the pull, in the string? The answer is obviously two pounds To prove this insert a spring scale any place between the brick and the string the spring scale will read two pounds. Thus we see that the gravitational pull on the brick is a force that can be measured by means of a spring scale

From this little experiment we also learn that tension is a force, to We have men timed before that muscular pushes are also forces. If you talk a could spring between your hands and compress it you will not that as save deterases. To do this require a force you as in the case before a force you as in the case before a force you as in the case before a force you are not as the pring when placed on top of it just as much as it will elongate (length on the spring when pushes solven down the six of the pring when placed on top of it just as much as it will elongate (length on) the spring when suspended from it in

In Goong Jeu stretter was the abundant of the stretter of a poul which cleaned force as a push or a poul which steed to change one to more the stretter of the

WE SHOULD LEARN TO USE THESE TERMS OF SCIENCE IN THESE TERMS

mores and so it does work BIL 12 COUNCILED HILD PRINCING CHEERY WHER IL energy of the pile driver when it is in the the ground Thus we see that the potential descend it can do work by driving a post int the pile driver is released and allowed to mesn by energy-ability to do work When of doing work This is precisely what we we know that this pile driver is now capable is stored in it from our discussion betore te lifted work is done on it Potential energy driven into the earth 1/ hen the pile driver some feet above the ground and then allowed -s page weight that is lifted by machinery this clearer 2 ou know what a pile driver is falling we got Another example may make peing converted into timetic energy of the tential energy of the lifted weight is slowly the clock. Here we see an example of how potue time they descend slowly and operate Since the force of gravity acts on them all are lifted potential energy is stored in them ated by falling neights It hen these we ghts y on may know that some clocks are oper

IL IS V CVAVCILE FOR EDERSE MORE BOLERLIVE ENERGE IS SIGNED EMERGES

spon that kinetic energy can do nork purques away are only a few examples to wood the rapidly moving rivers which carry scending hamper which lovces a nail into tothego wp cu quinonispes y suib the detrees, word for motion) The swiftly moving muche energy (Ametic comes from the great pool which is in motion possesses poster are also examples of potential energy of mater at high level and the steam in a shring is called potential energy the body energy that has been stored in the clock true monuq nb manusbring of a clock) The capable of doing work at some future time (a torpedo heading for a ship) or it may be mediately due to the fact that it is in motion A body may be capable of doing work im

clude that energy is the capacity for doing

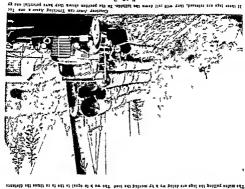
suples we have just mentioned we can con work was done in that case From the exbricks to the top floor of the building Surely se we pare mentioned before, in litting the may be used to drive a steam engine such ground work has been done A steam boiler RUDG the flour and when the flour has been turn is connected to the proper grinders to wheel of a flour mill, This water wheel in level is allowed to tall it can turn the water of the clock Il hen the body of water at high main pring of a clock does work on the grars motors. The mechanical energy stored in the to do nork it we connect them to the proper steam confined in a steam botter are all able up spring a body of water at a h ga level and the capacity for doing work. I has a could that under certain conditions bodies possess rrom our everyday experiences we know

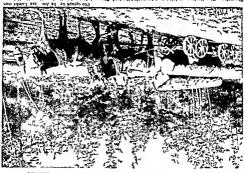
MORE IS MEVE ME EROM VS ENERGE

әшіі Қа рәрізір work in one tenth of the time Power is work the man because it does the same amount of the ateam engine is ten times as powerful as riquig the work by the time In our example an engine such a comparison is made by da paring the work of a man and the work of power Time is an important element in com it is because the steam engine has more to lift the nicks to the top of the building exerted 11 it takes the steam sporel less time certain amount of work the more power is work is done The less time it takes to do a count the time elenient or the rate at which done Power is a term which takes into ac turo the estentiation of the emount of work amount of work is done Time does not enter noth in one hour in each case the same tuat a steam shovet can accomplish the same to the root of a building in ten bours and enphase a man can carry a ton of bricks

ÓŁ JIME IMIÓ CORSIDERVITOM INE IERM DOMES IVERS INE EFEMENI

incee work through reading the book many with the book many in the following the follo





MOKK VND ENERGY IN A LUMBER CAMP



President Hunter College

Buidia as easiion Preste There are still some old seven gabled toric town is Elbing where a colony of Engle teresting of the old cities Still another his born, Rostock and Danzig are the filost in

Remet with its tributaries, is also the nerve seenery along its banks The lordly river, totots have enjoyed because of the romantic these west is the Rhine, which counters visi were centered in the great river valleys, batmany as well as its modern industrial life discovered that the historic beauty of Ger-I withing southward, you would soon have

beautiful buildings, among them churches destroyed so much of it, Cologne had many nerce fighters) Until the war against Hitler forests (The Romans failed to conquer inese tupes, led by Arminius, in the surrounding legions to conquer the warlike German where the Emperor Augustus dispatched his was once an ancient Roman town, from Cologne, the largest city in this talley, center of German manatry

Hows through rich coal fields and empires

w stuggish little stream called the Rum

LA war,) ou would probably have gone HAD you visited Germany before the

city's tamous museums and theaters former Prussian kings, and for trips to the the Braddenburg Cale to the palace of the and government buildings, which leads from Lunden, Berun s wide thoroughtare of shaps had it not beer for walks down Uniter den in Berlin might have werned uninteresting capital across very flat country The stay isse taken a fast train to Bernn, the nation's the Aorth Sea Then you would probably tivers, which empty into the same section of These are old cities on the Elbe and Heser

beck, where the novelust Thomas Mann was sealth and culture in those olden times Lutitul churches of these towns testuy to their nails, tashioned of dull red brick, and beautrade 'the timbered houses, quant town legia sto punt nh a biosperous soreign called because of the Hansa, or guild of merto the Hanseatic League of free crites, so Bremen and Hamburg, these once belonged becausedone towns stong the seacoust time After Berlin, you might have visited some

The course of life in General parts of the green range between the forest by the geography of the counterface of the bloom of the counterface of the bloom of the counterface of the cou

From more transmit-black persons and appropriate for more transmitted for the presence of the certain formation of the presence of the certain formation and the presence of the certain production of all the presence of the certain production of all the first of all the certain production of all the presence of the certain production of all the presence of the certain production of the presence of the certain production of the cert

THE SANDY EASTERN DISTRICTS ARE MADE TO TIELD GOOD HANYESTS

morning till night. gathering the clusters DICKING TIME LEEDS Whole Tamilles busy from and the plants are tended by pand triabespring During many months the soil is tilled umper have to be earefully repaired each ried up again in hashets and the ravages of earth washed down by the rains must be car ing punois Buidois our noda strog it se uns cions pecanse the grapes tipen best in the ing from the river valleys a very 100t is pre terraced plots that cover steep hillsides ru maringuous riere the vines grow on little along the Rhine and the Moselle are good in shire of many quirenties, the vineyards terrie, but in general he must make a tring tom in some regions the ground ne tills is closely attached to the soil and to local cus peasant Like the French peasant he is methodical and scientific than the French The Cerman farmer for his part is more

IS EMPCLICED CONSERAVATION OF SOIL

modern enterpres—doll natural, for many under the dependent of the dependent of the dependent of the dependent of the dependent on the many people worked for cuckoo clock, such size manners and the foundars of cuckoo clock, such size manners mere admissible of cuckoo clock, such size manners mere many of cuckoo clock, such size manners mere and the foundars and control of the dependent of the d

be the word of the mean and mostone mile of the control of the con

NYMDICKYALS EXIST SIDE BA SIDE

year by German latmers and arteans life, was performed reverently every tenth Tassion Play, relating the story of Christ's these towns was Oberammergau, where the stand still-that is, before 1939 One of charming old towns where time seemed to Baranan Aps Aestled in their raties are snown of these ranges in Cermany are the and the Carpathians. Perhaps the best by mountain ranges, offenous of the Alps Danube is flanked over most of its course tope It empires into the Black Sea The the galenay to southeastern Eu many, but later on it becomes a mightly region of Wurttemberg, in southern Ger river at its source in the hilly, picturesque contheasterly course The Danube 15 a small across half the width of Europe taking a Danube with its inbulaires which flows There is at least one great exception, the

DONNAER IN THE HITTS OF WARVIEWERD THE PRINEW DANGE RECINS ITS TONG

Lambles cost, the Blue and the Older nuces cross Germany These broad streams are cross Germany These broad streams are ned Germany problems and manufactured but cutters were bound to the Blue, the Older and moust of the other runs or Germany take a general nonlinested to the other states of the Blue of the streams of the cost of the Blue other properties of the Blue of the Germany takes and the Blue that the Blue of the cost of the Blue of the Blue of the cost of the Blue of the Blue of the cost of the Blue of the Blue of the cost of the Blue of the Blue of the Cost of the Blue of the Bl

nto the Khnee north of Cologies, Near He proports and contract of the cologies of the state of the cologies of the cologies of the state of the Certains acted inclusions to these the great infanct port of the Annober as the great infanct port of Certains, so that industry teles on one imported from the cologies of the cologies of the source of the source of the cologies of the cologies of the source of the source of the source of source very notable effect upon the development of Vandals to tule numbe these univer had a Coths and later attempts of other tribes the Then came attempts of tribes known as the Chaos followed the collapse of Kome

Koman Empire

across Ciermany, and eventually intaded the Starte finally gained the upper mand swept Europe some of them Germanic others OF THE MIEEUNGS The Libes of easiern man chics, notably the Eppa and the Soug rary history can be greated from the Cer spont their rel gious beliefs and their main 3 Well ordered society presser miormation Koman Civilization, were unable to establish this monky mey nad some contact with to the unconducted tribes north of the

areas of waste land under cultivation instance in Spain where they brought tast romans in various parts of the roughte tor Colonies of these tarmers were settled by the able serice by practicing the art of tarming limes tendered Europe an enormously valu who lived under Roman rule south of the but much emphasis on lamily life Those nate non a living from the soil and or have eiged into many tribes The poople seem to ancient Germans except that they were di We do not know a great deal about the

and & tenns Cologne eastward to Mcgensburg (Matubon)

A Cothic Sgure guards the lows at Cond on the Messite



smit mad in the feeling In their time or oaxon monarchs, notable for their energy stomed only by the Pope Part came a rine the imperial Crown which could be beand to preserve for their lamilies the time to munit noplemen who were their subjects man rulers strove to relain control over the Deregiter, Ger

n seems of the Pact of Aumen (1938) many wanch came into being temporarily as was about the same in extent as the ber rated The German Lingdom thus created Cerman portions of the Empire were sepa another Pinally in 843 the Frankish and tong rapes tought and schemed against one KINST ISCHOUS DESEND to dustrel and the Val could not maintain the unity of the ream Uniortunately, Charlemagne s successors

it made possible a Christian dominion in which peace could be preserved ON WHICH IS WAS DASED WETE CONVINCED THAT beobies and those who cherished the tuen nation but a sort of rederation of runopean auegrance to him het this empire was not a connectes were allies or owed some sort or of central Europe /eighboring tribes and tand western Germany and other sections and part of Spain most of Italy Smitter MINIOR OF CT & VAST ATES - N DAT 15 DOW FTANCE Holy Koman Empire He was thus given to at Kome with the new title Emperor of the in the sear Soo Charlemagne was crowned c mistish schools in northern Europe

per eved in education and founded the mar ity his also fostered the arts of peace the ons and compelled them to accept Christian n once merculess king sublugated the cax sest of his rule in Aschen this truly great This took on definite form under Charle-magne (768 814) Having established the the tranks set about tashtoning a Lingdom mgs Clovis and Charles Martel leaders of with what they understood to be its teachthe source of unity and order. In accordance thing to Christianity Keligion now Decame the convers on of powerful Germanic ch el new social order 1 his came about through Second France provided the basis for a

REPORT IN THE MINER CENTERS. CHRISTIANITY COMES TO THE CERMAN

these tribes—the branks

Indeed France gets its name from one of man tribes in the west pushed into trance persons birefournessely Stavic while the Oet ceased to exist. The territory east of the Libe once have been called a Lerman race TITLES DECRETE SO INTERWOLED THAT WHAT IN BUT central Europe Slavic Germanic and Cell c aruntered and linears in this cobbind all Bernkatries als mentakeries and with its park-resided desert.



Johnog to Rei felle and lanconia commercials commercials commercial for the commercial conference of th

tong religious purpose truck had created a state that was divorced from religious purpose an author, mas a controit a religious man Prederick look hittle m ferest in the alians of Germany, which be seised their chance to necesses their power and miluence As a result, the tunity of the Lupite could not be meantained after has

ow the Papacy and its Italian allies were

Allet the Status emperors helter are some more sharing the status of the

to no say of the country disoughts of the sta of the country of th

After the line of Stazon hages came a sum to be of Stazon hage of the best of the state of the s

LBYNKICH KINCE THE SYFIC DANYOLA OL

monnateurs were to hand and a high spuriual fevror was fostered. The things Cabases of Cermany gradually became deeply originar and unferested in the edition of Desires of the mosters of the people seere settled times the mosters of the people seere very badly off. They, less entablishesed than the booling, other presented the people seere very gross safe by safe with Christmany.

Straint will through a double store in a date

quarreled with the Colish soi creigns and the northeast of Europe But in time they pressive example and they Christianized tui isom auf st Bizurel jo ginos isni Bingua res They erected castles of which the Mari which were affiliated with the Hanseauc cit nize a vast area. They built towns some of completed and the hn ghis went on to colotic per Ture mission was successfully ac ine marches and woodlands south of the Bal rrussians then a heathen thice divelling in out ambitue in leasts of bristo i to gain, add tury, the Tentonic Anghia were invited by religious rule Early in the thirteenth cen taped lives of service in accordance with a highest pledged themselves to live unblem period of the Crusades, Those who became sereral military orders founded during the An ghis were organised This was one of During this medieval period the Teutonic

conjq pe need tor noble poetry in so doing proved that the German language ove who sang the prairies of fair fadice and istened also to the minnesingers or poets of ner's Lannbauser reminds us the counters ang done in Italy and France But as Wag was intense interest in the literary work be beschied and where at the same time there contra where religious devotion was ardently

The wealthier princes maintained splendid ang this era adorned with masterpieces of sculpture dur

A movement within the Catholic faith led came to be known as Protestantism. rengious change known as the Reformation hunsell ready to defend Thereby the era of torin ninety five theses which he declared ber 31 1517, he nailed on the door of the to advocate ecclesiastical reforms. On Octo Varius Luther an Augustinian monk began and were crushed in a bloody war Then tor neresy nhereupon his followers rebelled Huss was condemned to death and executed rogan was also a popular preacher movement led by John Huss a Crech theo being undermined Trist came a retorni Meanwhile older rel gious loyalties nere

tions Lisuce and western Cermany to the tuxuries while textiles and other wares went sbices assured the Western world of these West A rich trade in furs and damasks and center of traffic between the East and the Alter the Crusades Germany became, a regacy of the guilds !

It at 11 autottunntely destroyed much of the and some of its most beautiful cities (Norid is indebted for a great deal of its finest art of master crattsmen to which central Europe was the age of the guilds those associations creased among the people nevertheless This dan in the political sense but well be ng in The rule of the Hapsburgs was never tran

sien igoq ization in eastern Europe Thus she looked der tustria came to be concerned with civi lor so long felt as a threat to her eastern bor ter pecause fue bower of the suitans was (en Apar sign of weights as to fourt aw restures one the customs and manners that dukchom m France and to Burgundy the the cast Austria controlled Burgundy a west while warding oil attacks by the Turks to defend the boundaries of the realm in the SEM AREI 11301 DAG GITTEN GORDI THEN WHE to the Hapsburgs These princes had their one dynasty to another to come back at last Fears that followed the crown passed from Hapsburg prince was elected emperor in the The Interregaum ended in 1273 when a

DOMESTAL BYMILT IN CENTRAL EUROPE THE HAPSBURGS BECOME THE MOST

toty as engineers and colonizers were well in advance of their period in biswere however gallant Crusaders and they was often oppressive in their best days they and greed The government they established were themselves weakened by worldliness

recruited by force and shipped abroad the American Revolution These troops were Sump samue asimist and or bevies our energ as soldiers You already know of the Hesmany sold by their princes to other nations were almost extinct Many Germans were acdependent city men) of previous centuries over their subjects. The proud burghers (insuche, who exercised unlumited so ereignly of the states were governed by absolute monlough of the cuizens or by the ture and pold the religion professed by either the mathese small states, a court was pledged to up ductues and tree cities in the majority of kiest onuper of independent principanties, Octuenty was now (1048) made up of a sayndam an

a league of European nations pledged to set-Furning Frank (11st-18ot) He advocated tollowing control by the Break buildenber. princant of these was outlined during the crethagh tobics of ascussion tipe most six-sua bigus for the bicsetration of beace were rence by the German people for a long time of modern Cermany War was beld in abnor boundance of the German states it also, to phalia, signed in 1648, fixed the religious longing for peace set in The Treaty of West much treasure was consumed that a universal in thermany so many in es mere tost and so war once again, and wrought terrible havoc Later a Franco-Succish alliance waged atter the Swedish king had tallen in battle aimy won notable victories but was deleated in support of the Protestant forces. This Ang Gustavus Adolphus invaded Germany powerful swedish army, commanded by able general of doubtful character Soon a most part commanded by Mallenstein, an this conflict the imperial forces nere for the

and we have see witnessent to no see all daily debate see witnessent to no see all straints and in seek native see all (see all seek all properties of the properties of the seek all provided as an expension of seek all provided as an expension of seek all provided as a possibility and seek all provided as a possibility and seek all provided as a possibility and all seek all properties seek about 10 pages and seek all properties seek about 10 pages and provided as a properties of provided as a provided as a properties and we have a provided as a properties and we have a provided as a properties and we have a provided as a provided and we have a provided and we have a provided and the prov

In architecture, fullococce commit from the configuration of the configu

Even ano, the care authorscade agreet increased of interest in crivic affairs as well as the care for many was natures and part by the lathan Renaissance, and in part by the lathan Renaissance, and in part by the greet of the Vebbreinard. Thus was an era of greet meeting in part by the part by the laterature, in panhage and scuipdure Litter and the complex of sevent studies.

by the scorety of Lear, solvents of St Igns that California, but Job Laternal Lear, solvents and the Confere Medical and Germany was drieded into two products Returned to conflicts are reterior to conflicts are recognited and Germany was drieded into two broadle camps of the conflicts are frequent, and in addition a Present State of the Conference of the California and resolvents of the times are conference and resolvents and resolvents and resolvents and resolvents are resolvents.



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ration and the bleak poverty of many of the tunz despite its lack of political organi and the promise of the future

tours' contains porp the legacy of the past which included virtually all the musical muce were followed by Ludwig van Beetnothe first great writer of German opera, I nese generation since their time Mozart was also mericacy, which has east its spell upon every composers as Handel (1685,1759), Haydn (1732,1809), and Aloxart (1756-91) To then the magnificent The work of Bach inspired such eminent

nuzachazzeq tor trepueza and depth curring, in the opinion of many students, uces and nobility of character rits music mental music and a man of singular sweet 120) writer of both choral and instru ter was Johann Sebastian Bach (1005 es and arrefoctats. The first illustrious mas octusts consic, under the patronage of princ orinessed the magnificent development of The period after the Thuty Years' War nue essiest to inderstand

boer of the German people, though he is not during his lifetime than nere his tellow poets het he is possibly the foremost lyric also a South German was less well known service Incdrich Hoelderlin (1770-1843) Soung Germany learned a code of sdealistic decades Schiller was the poet from whom later generations of Cermans During many dom 11e exercised a profound influence upon South German devoted to the ideal of free-Liteditch von Schiller (1759 1805) was a enst of bower

of Germany's greatest dramatists, and a nov lobana Wollgang von Goethe was also one masters-Goethe, Schiller and Hoelderlin not later were scaled in the work of three ten models Heights attained neither before Cerman poetry influenced greatly by Eng eighteenth century there was a reburh of Laterature, too, slowly revived During the

HEIGHTS IN THE AGE OF CORTHE LITERATURE AND MUSIC REACH GREAT

mained of an older are architects blended new ideas with what re-Set the extraordinary skill with which the pre ernqued these great buildings can not for and palaces were erected. The traveler who chriecture Spiendid monasteries churches benty The southern regions of the country states tregan to recover a measure or prosmay the beople throughout the Cerman LOWARD the close of the seventeenth cen guet bobnjons state

died in 1786, Prussia had become a strong up) or rotand when predefice the Great Kussia and Austria in the Partition (cutting theresa of Austria, and had snaked with Silesia from his rival, the Empress Maria a dabbler in the arts, and a friend of the French philosopher Voltaire, Hithm a few years, Frederick had niested the realm of upon occasion, warlike monatch. Frederick II, called the Great (1717 86). He was also state possessed a very gifted, cymeal and, It suddenly became evident that the butle was deemed to add juster to the ruling house organized in Prussia because such a torce and emelently tuled A standing army was this point it was autocratically but Irugally tried by the Monenzollern lambly and at terniory from the Teutonic Knights It was surerged primarily inrough the purchase of denburg in northeast Germany and had been consisted originally of the territory of Bran bowerful This hitherto unimportant state gradually the Lingdom of Prussia became erty stricken Germany The Hapsburgs still spaped the culture of a backward and pov during which french taste and French ideas AIV (1638 1715) in particular was a perme on the Continent The age of hing Louis France had become the dominant power

Wartburg baues where Luiber translated the Bible



of Lincoln Principle of Cerman uni-Pruscia next slood forth for German unity At first her motive was a real desire for thereal government Then (1862) Prince

"buble seatment acked for "purishment for organic constitutional government for a model Generally All All Seatment Constitutional government for model Generally All All Seatments for the foreign and a model of General All Seatment for the foreign and regular density which is the problem of General many But a centre of the foreign and the foreign an

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NEW INVENTIONS AND PACTORIES CAUSE UNREST AND COMPLICE

The was a stellar library modern Germany The demand for unity and retoring did not except in my second in the second of the seco

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The peace conference, known as the Congress of Vienna, doomed these hopes to ex-

wavez we just the cause our stoody, was used to the cause our stoody, who was the cause our stoody, we can great centre of the cause by the guardens spot of the cause by the cause who was caused to the cause of th

SLIES VIT CERRVAL DESIES VOS DALLA GADES CHE SOVER

First some of the Sustains nonninness and the state of the Sustains of Sustain

eration was enkindled and Prussia, bon ever a flerce desire for libstates became allies of Napoleon In Austria began Bayaria and other South German defeat and virtual conquest of all Cermany parte assumed command of this army, the of national sentiment After Napoleon Bona a great and enthusiastic army on the anvil duced conscribtion, declared war and forged newborn French Republic France intro Luissia in 1792 constituted a threat to the An alliance entered into by Austria and his Austrian born queen, Marie Antoinette strove to defend the cause of Louis VVI and reliccinals, but opposed by the rulers who ming It was nelcomed by many German in olution is applied, had its turbulent begin in France, to which the name of French Re-Then the long process of political change

IMIO LMO CVERS AVEGLECH DIAIDES THE CERRAN SIVIES

of the eighteenth century, the knoose of grant part, such men were dependent upon the part, such men were dependent upon the he oout with the prestage of their names has out with the learn and the measures were miling to accord liberty of expression to mee of genue and talent Centural field and the cut of the

MITH A POWERFUL KAVY GERRARY COATRONES THE WORLD

tente Conduale, in 1904 mendiy sort of agreement, called the Enwith the Cerman Empire, turned instead to Col ernment, which had sought an alliance s result of this atrogant attitude, the british to get such offers, Germany relied on stress others, the most sunable triends in order tries but should select, from offers made by should not court the good will of other counbenet that so powerful a state as Cermany 1939) He seems to have been guided by the doubtiess Bernhard 10n Buelow (1849" The ablest chancellor of this period was erested in the doctrine of Aryan supremary and dangerous ideas Thus he became inmaily sensitive and influenced by romanic sprewdness, but he was unbalanced abnor Milhelm was not without intelligence and effect of air toolish and warlike specters icies, and, on the other hand, to sotten the ont the Emperor's blindly unreasonable polwho attempted, on the one hand, to carry ass followed by a series of weak statesmen tron Chancellor was compelled to resign rie marsell at odds with bismatck. I'm grant the throne, and almost inimediately declared Den (1828) Paret Pilhelm II came to

WILHELM II TROYES TO BE A STOUDORM, WARLIEE RULER

This episode is known as the Kulturkomp! attach he waged on the Catholic Church. largely due to the savage, but unprohishie, sew toward in the second endeavor was tie dominant inside Germany That he did ness he strove to make the Prussian way of Brataun and even France, while at the same the courted the good will of Kussia, Creat to manufain the balance of power in Europe actendy powerful, and he strove carnestly dered that the arm Cerman Empire nas suit the victories gained Bismarck, it is true, becibine which they deemed responsible for mg or strength, and applauded the tron dis discuses yearn cermans reveled in the tect desimed to have the most somber conse So now, after the Versaules Treaty of 1871, the Germans were united It appeared tutions under a constitutional monarchy by teason of a successful war. This gave rise to a militaristic spuri

Artistic and intellectual life between 1800

IDEV OR REEDOM CERMYN BOEIS ERES YFINE LHE

The frestly was agreed at the establishes need to the control of t

Institute wat holy of A children at an animal and animal a

FOR BISHARCE AND PRUSSIAN IDEAS THE DEFEAT OF FRANCE IS A TRIUMPH

Vito von Istanarck was appointed president of the Council of Ministers by the Prassian Ling This able, resolute and often uncert pullous man turned Prussia from the biberal way and tonard a barsh, arrogant spirit

The results of German diplomatic blun the demands of Austria ednetty unsuccessing in an attempt to sorten was unsuccessful and his chancellor was mand their order of mobilisation in this he descored to miduce the Russians to counter of the semousness of the situation. He en sible nat) haiser Il thelm was now awate moons to be mobilized (made ready for pos France Now the Russians ordered their had conferred with the government of Detote issuing this warming the Kussians threat to Serbia (like Russia a Slav state) declaring that it would not countenance any action, the Russian Covernment intervened the Seruian Covernment Learning of this agreed that stiff deniands should be sent to Wilhelm II and the German Chancellor who Berchiold descussed the matter with Laiser viewed with alarm by the Hapsburg Empire curbing Serbia the ambitions of which were garded the assassination as a reason tor tustrian foreign minister Berchtold Sarajero a Serbian town Count Leopold to the Austrean throne was murdered at Archduke Franz Ferdinand heir apparent began io form over Europe On June 28

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across the Yorld See have country and across the York Carlon with Russia has public from the Carlon with See as telepared to the Carlon with See as telepared to the Carlon with any was telepared to the Carlon with any word part of the Carlon with the Car



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"Float" from wood a wartiffit German product

the 11sgb Command supposed morale of the troops was actually better than ger of starvation On the other hand the firet The people at home were in grave dan was without either tanks or an adequate an problems could no longer be solved and it tied no reserves of man power its supply in hisry machine had been badly beaten it this case I ghing was never resumed There armed ce te a temporary stop in fighting in which its High Command had requested An berman Army was granted the armistice to Holland and on Sovember 11 1918 the man Can net sued for peace The ha ort ned ted that the war had been lost a new Ger it the request of Ludendorif who admit

"Meanbulle however the good some dispersion of dispersion of the Leuckl States had become unwhere and disperse with the control states and the control states an

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the estastic phe which soon engulled the one a neavy measure of responsibility for the rightenuspess of its cause and yet each eit tor the trent Lach nation I elieved in connerses sold era sang and let ghed as they plood treasure and social stability in many lict thus started a suld ultimately cost in Creat Britain to one foresaw what the con ben against Serbig Russia France and Germany and lustria nere committed to ciamed a state of war and by August 4 chart of Berlin On July 31 Germany pro-Sance that she seemed to be acting in the entre pue restrate piuster and arrebutch On the other hand Austria had been ina and so fustria could not be left to the apparent 'II e only dependable ally was tus dering atter the days of Bismarch were now In addition the Treaty of Versallies per mitted a Centran army of populary browns as the actionizing, and was in a position to said dis actionizing, and was in a position to said dis and several personal personal personal personal and several personal personal personal personal personal personal and several personal personal

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Germany was chaotic A sort of the opace, we consider the opace of the constraint of



stabwad sporal established sampe in a wily is more to see the firetile figures are releg paraired in delicate relegations.

gantzation of his party, hational Socialist He was persistent nevertheless and the or lattle noticed He was in prison tor a withe and for some years thereafter Haller was man Huler's Putsch was easily put down attempted to seize power in 1923, Such an Ger triends notably General Ludendorff, and he gardist and spy Hitler made inducental of the Reichswehr of Munich as a propa the German Army, and was now in the pay trian who had served as a lance corporal in cant. His name was Adolf thilter an Austhem has one who at first seemed insignifi Suomy partaquisip pur paysitessip aqt 101 risny now sought to become spokesmen

entigrad derigate rety tew proliteers resentment reached te many changed without benefit except to a erty and the whole social structure of Ger uniquie crasses were reduced to absolute pov the war Speculation was unrestrained The noting part of what it had been worth belore December 1933 it was worth only one bil mark ceased to have any real value when in Dietera andermanna their currency The with passive resistance which ended by com arations The Gern and countered this move tres there as pledges for the payment of rep valley and seize German muce and mdus rue decision of France to occupy the Ruhr the third his or problem was created by

One enters this is a century Lubeck gate below



Further support came from quite different fired Buons a olni inama ront att bannan into civinan hie, it was youth that transeterans who could not find their way back the creation of discontented World Mar people, Lven though the nazi movement was not be taid abou the destiny of these young order and bitterness Too much stress can and grown up amidst violence inflation, disment donarionag a lo baint ads com sidgican the Reicherag This prophecy was based on toters would elect more than 100 Nazis to lonusurate pag bredicted that by 1930 thest during the Nat was coming of age An astute the party members The generation born stipends (small salanes) and ceremony of mest tame were attracted by the unionus that young voters going to the polls for the The Hitlerites profited especially by the fact well as the Communist party, began to grow Dating this crisis the Hitler morement as

LUBRIAGE 12VE BEL GIVE TODIC CERMES ARE DRAWN

old with kitle left of his former vigor Field 'Israbal ton Handenburg grown ter dent of Gernany at this time was the torner for more motion only tery slowly The presi cumery of international discussion could be reparations question Unfortunately the ma in the hope of settling once and for an the connect to resort to drastic measures party rible magnitude compelled the Cerman Gor to increase rapidly Soon a depression of ler its were affected and unemployment began America in 1929 German business and cred then the great depression started in

should mercesse very much or if the flow of mile it was clear that if unemployment not too badly off but he rarely had any sav penetitz he enlosed the Cerman citizen was security were deducted in view of the social month From these estinings taxes and social coo carned less than 200 marks or 550 a were gannfully employed Of these, 29 500 bobujateou-25 200 000 men and nomenentinelly wiped out the class that lived on need nousing projects. The inflation had proced The government encouraged and in seruma and our parimapout atam the transmility and prosperty Industries rara the country enjoyed a period of reta the United States and between 1924 and Octuban finances were aided by loans from of the equally extreme Communist party

nent on side by side with the organization

A cartle at for the Steeping Beanty near the Morello

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and tel gion were any longer able to muster support for a moderate position

the trade unions VinO massan to et--communica neme or the om choose one ex that they must payanad VOTETS Cennan Mash stonal setbacks erson to stick m ter in Germany tam grew mght נוקה פן נפקוכפן chancellor Hitler was named яіл гозз ирсц then until Jan ! Renchstag From 104 01 paragra 51977 estegates detegates 1630 treu Loi

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When the work of the Chriman police were the West State of Her Christophe West State of Her Christophe

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to who were and their conservative alines were
the hars and their conservative alines were
who were still allowed to vote were counted

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"Accredited," start Missing, Accredited, are might Square, are might Square, be sended, Creat Britain tried in access to the control settlement of the most of the control settlement of the most of the control settlement of a start of the creation because of the control settlement of the control settleme

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The Company and a return to the property of th

Gur and tierts of tanks amassed by the Czech pirot together with stores of raw material shord out, alton from ments, the block and thus Lained control of one of Lurope's conntra | Inte he did during Starch, 1939, Prague, the capital, and take over the whole few doubled that he would soon enter parely Czech regions of the little republic, and promused to respect the borders of the nany secured a guodly slace, Although be for Crechosteratia was earled up and Ger Cermins and Italy Mitter emerged the ticmeh, September 19-Great Britain, France, tour major poners in western Europe at Muconference was followed by a meeting of the berlam, British prime minister, decided to it the height of the crust, Neville Cham-

ROS BILLES LEE MONICH PACE, A VICTORE

to its assistance, the Corribosionalism Covemergia adopted a firm attitude, and during the summer of 1938 a general I-uropean war seemed almost certain Czechosloska, was now sociely literaterod, and a propaganda campanga agama; that unhappy country vas soon in lita samp were being mistreated. The British Government dispatched a commission to study the question Since France was piedged to come question Since France was piedged to come

LOW COMBREEL CONSCRENSE.

other forms of foreign exchange acquired substantial amounts of gold and panks of the country were looted, and littler many of them died after brutal abuse The perded into concentration camps where ing two days, more than 50,000 persuns nere cities were burged of the opposition Dur necessary being and other tustings to no longer existed it became but a provgave in and Austria as an independent counstaticd marching. The lienna government the vote was taken an armed German force (Reneral vole) on the question but before gin ermuent in Lienn i called for a plebeseite zis in fusiria who wanted lescottuts the fusing with Cermans There were some 13demanded trucklust, that is the joining of more justes was the first steim fittler

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n are declinedly are raised to the neity en Berlin the same got beindamer Platz. Most of the great cities of Germany are raised and about the great of Germany are raised and about the great cities



tors of war of conquest plunge the norld into the hor bie so that never again shall their dreams soper decent way of life for the German peo on this earth We shall have to exist together the tragedy of a pation that desirol ed itself day it appears that the story of Germany is ts not a country that loves or trusts her Tono hope for the tuture in all the world there ass no central government no great leaders from the ills of unspeakable poverty She cipes are in ruins ther people are suffering Now Germany lies desolate Many of her

would har 1939 to 1945 and lost that one life for a nation 50 it brought on a second that the peaceful way is the better way of papuration for seal little and store convinced THE BLOCK IS TOUGHT AND TOST & WOLLD WAT became an empire striving for greater mili gether once more into a strong empire it miniary men they brought the states tobismucd as military men and as victorious

tisell lorward 1ts leaders lived thought and the Cerman states Prussia began to snove to ano the head and a mostogent and It nost time were gobbled up one by one by Aapo at bas diege siede fell apart again and in rousen rubite As the centuries passed the memseries ander the banner of the Holy tion You have seen how the states algred -o van searning and a deepening rengious des oareas becoming states with growing wealth italy and trance and the German tribal matched civilization move northward from boring tribes to the north and east 3 ou have the civilized world of Kome and with neigh tribes at war with one another and with pare seen in the ancient days the German portant events of Germany's history You We have in these pages told you the un

agination for centuries to come of a catastrophe which will stagger the un there can be no doubt. They are the authors Hiller and his benchmen for this tragedy primarity Of the complete responsibility of est and most costly struggle in the annals of convertedence of informure packs or of Chann of Chann of Chann of Chann of Channes and Channes and Channes and Parager companies, not only account that the Channes and Impanies to Orlets 1st to come muo are and in those soft thousand the thin and impaniation of Chil Chuid mag level for their salert Chuides and special friendship in the Chil Chuid and Special friendship in the Child Chuid and Child Child Child and Child Child Child and Child Child and Child and Child and Child and Child and

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the ladies who were sewing there threaded needles and loaded pun cushions for down to their local Red Cross norkroom and ecd ware wingspen I prese Brownies went of Eronnics proved that the growning were person or use do in the wat ettort. One group that there was not much that a Brownie age the beginning of the war growings thought the people at home pleasant surprises At BROWNING - THEY BEE RIVER IS ISSUED TO SILE the things that are such fun about being a CE ELIZE TO FUOM HOM TO GO THAT IS ONE OF which older folk do not really expect young as well as hundreds of other useful things dings to thread needles and sew on buttons reasts to mach the dishes to make milk pud do a great many secret good turns they the Exit fact erect day but most throning mounted like Guides are expected to do

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akken the same Promise at their enrollment and have pledged thermedes to do her hear to keep the same ten point kaw in abaterer country they may be, you will find them country they may be, you will find them amping hiking singing and learning

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By K Madine Corbett

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Ibese Arymaine bely Mother with the belate.



rean guls nant to have tun and good tunes Tire these Brownies millions of Ameri of the most popular volumes in the library of thedrord on the shelves and it became one the children a library it was the only history them in book form and gave their book to man) itasels about town Then they put what they beard read or san during their the brownies ande notes and drawings of

tell them about days gone by nhou the old folks of Arctiona who have to judian settlement. They climbed over a wall nial homes and forts and the site of an old ago by a glacier The Bronnies visited coloecars that had been made many centures Aledford a fields their leader shoned them Of course their trox p leader helped them On all about Mediord from its very beginning theur library So they set intih to find out are no bappisped pistory of their town in begin to come They discovered that there town something to remember them by for these nuncteen brownies had given their done that was so important?

Cut scout province troop was bad they zine as well These young girls belonged to a the town of Medford but in a national maga as authors artists and historians not only un old who suddenly tound themselves praised a group of girls from seven to ten years P in Medford Massachusetts there is

chance to belp build a better imerica bestiet To all guits who wart it it gives a bons of Gal Scouts are now putting it into in in seven to eighteen years old and that s bern of work for Joung American guits by American Curis for Inscrican Guls it is an outline of what they wanted to d) They called their plan / Design for Consensing ics Girl Scouts and Senit Girl Scouts made By means of a natt n wide survey, Brown estra (out tran ad 10t low to neld a noties then on bounding to broduce the organi currie membership of the Gut cours was signife make there decisions but in 1945 the asteen decides upon Loais and pregrams and I ractically every forward looking organi

Surrer e Surpring in Surrerado-eo 10 surout euces queuel que l'est po queens mais aun tration. Older Girl Scouts held many conter Strong Keltel and Rehabilitation Mining wise Corps in its campaign for more nurses and helped collect clothing for the Cinical on for that agency They aided the truty the nation wide clipping arrive they earlied ciestions from the Treasury Department for to 1945 thousands of Carl Scouts carned ard of children all over the norid

Evendship Fund which is dedicated to the contributed to the Juliette Low // orld and sines to combat erosion All Gittl Scouts cutting down underbrush and planting trees Scout Ranger Aides were able assistants in Lotest rangers tound that Sentor Giff

tutions which needed Scout services tism to shard lie at bue estructua elettopod years old worked on tarms and as aides in lope Seinor Gil Scouts affecta to espicent tres in doing a great many different kinds of sold war stamps and helped their community but setus sanaged materials bought and their mothers The ten to fourteen sear old tot smod is edot bbo bib bits squiess isw tubnoq age yes ut padjay spio-seas uas os nce during the war. The Browness the seven visc 1951 nulles to study coo, coo at 16 pterset Scouts in the United States had rolled up a By the time Japan surrendered stace Pearl Harbor

Afmost 500 000 girls have Joined the Scouts of these things by joining the Girl Scouts spd to be useful too Many have fout dail

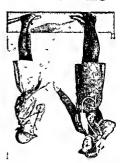
Brownes promise is not quite such a big Brownies motto is Lend a Hand The t brown uniform with its own badges The pitchday, may join a brownie pack and wear yux kin' once spe per bessed per seventh are divided into groups according to age Jounger sisters called Brownies? The Guides Did you know that the Girl Guides have

Camping biling singing and learning connert they may be you will find them to keep the same ten point Law in whatever sud have pledged themselves to do their best taken the same Promise at their enrollment

All of the girls in this huge family have on the Guide and Brownie in the picture City Cuides wear the uniforms that you see dies white uniorms are worn in Canada conntries such as Brazil and the West In not the same in every county in sery warm Gul Scouting The color of the uniforms to Girl Guiding In some countries it is called chain around the world. This is the chain of hood of girls which stretches like a HERE IS Erest world wide eister

By K Madine Corbeit

GIKT COIDES



[221]

and special friendship ing feel for their sister Guides a very real known the fun and inspiration of Girl Guid come anto its ranks 4ll those who have of Curdes and Brownies to others Jet to and size up and down from one generation chaing spreads not only around the norld or Ranger companies Thus the chain of

come leaders of Brownie packs or of Guide Many Girl Guides when they grow up be-Bailegiven 101 Viezzooen 21 Jeal bandle a boat and to know the weather love

their Symbol They learn to swim and to as the crew of a ship and their Guider is tarty lond of the water They are organized come Sea Rangers These girls are partied Some Kangers prefer to specialize and Deogsility to n wot tas at modgen of

nappen at home and the ones that are likely emergency—the every day emergencies that must train herself to meet every kind of and resourceful person and so the Kanger An explorer or a proneer must be a brave

te both an explorer and a pioneer blion isbin add oint tuo samon! bue we. near thousand the Cuide spirit of their age of thenty She is asked to carry her prac more than tourieen years old and under the more useful citizens The Ranger is usually Brownies and Girl Guides really make them prove that all the things they learned its called Rangers and their special job is to The big sisters of the Girl Guides are

the ladies who were sewing there. threaded needles and loaded pin cushions for down to their local Ked Cross norkroom and ech much mistaken These Brownes went or recommes browed that the grownings were became comit do in the war effort. One group that there was not much that a Brownie-age the beginning of the war grownups thought the people at home pleasant surprises At Brownie-they are always learning to give the things that are such fun about being a er guts to know how to do That is one of which older folk do not really expect soung as well as hundreds of other useful things quotes to thread needles and sew on buttons tearn to wash the dishes to make mith put do a great firing secret good turns. They one good turn every day but most Brownes Brownies like Guides are expected to do those at home

spe will theib beobje coath qu'h echecianh do her duty to God and the hing and that Empire promises that she will do her best to ne as important. The Brownie of the British gitts who take it are not so big but it is every business as the Guide Promise, because the

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STATESMEN OF THE ALLIED GOVERNMENTS

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HISLOKK-WYKFKS OF WORLD WAR II



SOLDIER AND SCIENTIST SHARE VICTORY





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DUSTICE OVERTOOK THE AXIS IN 1945

All this does not mean that an outsider can not make money on minor inventions I how a man, in fact several of them, who have from time to time neader an amounts of the control of the control of the control of inventions were, of course, not teally "invenmentions were, of course, not teally "inven-

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when the when the work of Smith is those as research decayed Compile by the research engineer in electronic cold in the by the control of the work of the wore of the work of



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We day show using 1871 State of the United State of the United States here of the United States here of the Why. He replied that he was going to find through another to be fore to the Original America of he fatter of Office went, As far as his job at the Patent Office went, As far as his job at the Patent Office went, as as nothing that to myen of the original of the Original Office of the original of the Original Office of the original of the Original Office of the Original Of

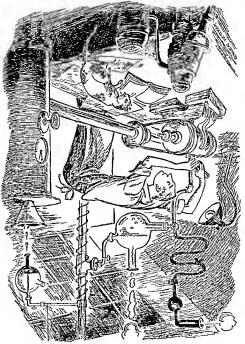
Washington Institute of Technology, Inc

By Will Ley

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TOIL AND TROUBLE AT MIDNICHT!

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Sumbling Bods, etc. [6, 21, 21].

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BETTE IN HEREYNCH ENOMIEDER OF SEVERAL LANGUAGES

has a balled a land and a treather at the managed a treather at the state of the st

could not kave changed over to a different field, and have been successful in it, if he had not had thorough scientific training to begin

with great success. The point is that he will later change over to a neighboring field who received his main training for one held mem a had easupen natio it no or bas ation engineer has to know meteorology, other fields where dy estutis are used An avi-TOOR (extiles, medicine, bacteriology and ested to dyes will also have to know a lot fields A chemist, for example, who is intertraining will often extend into neighboring rus don con in this particular field Such field has been chosen, is to get all the trainhat five pages long The next step, after a ren's or atomic physics-you can make a or electronics or applical biology or chem-Rotug to interest him it might be an ation, st play gards putter sty the year o. Aldres The first step for a compag insentor is

IS MECESSEND. FOND SCIENTING INVINING

explicted the possible usefulness. These examples show the reasons that These examples show the reasons to man earlier of older) has to be a professional man earlier to the first of the f

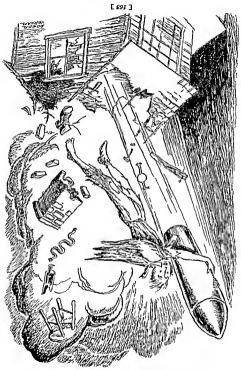
Vany investigants have defended on highly specialized channing. For insurance, the distribution of the channing hour insurance of such a tastice chast need only in professional chemists would have rec

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SURPRISE! SURPRISE! FOR GARRET GENTUS!

The rocket mont; where is selve, the selves selve, ally bursed; proved much most dufficult. At ally bursed; broad must be marked to find the more selved only to make up the motor of an uncooled montor. Suppose the docated on leave to the more selved montor of the more selved montor of the more selved montor of the more selved monto the more selved.

The state of the s

VER MADE FIRET DRAWINGS AND CALCULATIONS

but we have already decided that he was a wase man, and that he left multary reckers to government arranals and expert chemsts who, uncidentally, and solve the problem by evolving entirely new types of powder

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Affect lambug over for some time on would be marge with the decision that it would be mecessary to making the decision that it would be mecessary to making the white could be seen as the marge with the seen of the seen of

projective rockets in quantitates, 'After the blert study Carrier Genus would find out that they did not make the rockets because the were dropped by marshe, the twither year, we deer or gunpowets would explode violently when crafted rocket nould explode violently when

The stort of the course to the water a pixel of the course of the course

and persistent, but not always successful,

of the trade gone, he watches and picks up a tew triess after all However, while the noth is being Eres me work to a commercial welding snop rums his first set of tanks and covers and \$120 tor it hot being too good a nelder he a welding outlit at a bargam, and pays about a neiding outfit He is lucky enough to tind 230 for the work or whether he should buy a commercial welding shop and pay around whether he should give this welding job to welded on, and the question comes up speet stumment you the corets have to be tengths and cuts and files the covers from pe care pie synusumu inpius to biober pies' buesa' acten den ers and wrenches 140m for used tools, various kinds of harmets, He begins with an outlay of about \$100 MECESSYMA LOOFS

SHT ROT-ERREATE SERTORA

him and pag. af the Carret Gennus, m order to east e time, ragia and pays the fat the centering the bib bods bods. (Cheap, tool) After othat to gove to work. (Theap, tool) After othat to gove to work, that to share the glory with a ball dozen other people.

Garret Genna base to consider the conboundary of the construction of the conmerators and physica to they of the calculation measures and physica to make the exhibit math manufacture and physica to become a great of the construction of the contraction of t

to merie a procession of the configuration of the central mostle. Here the microtic which the microtic which exempled for the first time. The would need a detailed calculation which has a specialized rathery of processions of the microtic which has a specialized rathery of processing the microtic processing the micro

metal melted, Low walls of clay surrounding sarong enough to nerease the heat until the stead of a furnace. A crude form of bellows In sacrent times a sumple pit was used in-

saty, as we shall see undrove the properties of mon in order to make it more useful, other processes are neces principle of the great from industry, but to This operation is called smelting, and the product is pig iron That, in short, is the main non sinks to the bottom as a motten metal cathon combine and rise as gas while the nested to the proper temperature, oxy gen and cole) are placed together in a furnace, and carpon, so when from ore and charcoal (or paired soft coal) are composed chiefly of cost (bench penned mood) sug core (burn) torm new compounds with the carbon Char will the from its combination with from and ore at fairly high temperatures The oxygen Carbon will take the oxygen out of mon

pure non therefore, man has to drive out the oxygen. This step is ealled reduction of the ments—simost aluays with oxygen To get state it formed combounds with other elesin in the not gaseous, or monen (mened), means that when the mon of the earth was found It is generally found in an ore. That containing small amounts of nickel have been metallic, state although meteorites of mon Iron is simost never found in the pure, or

metalite elements, and iron is another some of these elements are metals, Gold, of which the world is made. As you know,

Iron is one of the nunety two basic elements biron isorid iore from and steet are important in the elecand other sources of electrical power Thereand magnets are needed in making dynamos

rug some rings of steel are easily magnetized, and steel (though lighter metals are also and steel (though lighter metals are also and steel (though lighter metals are also nachmery of many kinds, tools and bouse ons of great buildings, automobile bodies, silroad locomotives, cars and rails the skelerebecterily treated kind of mon Ships bridges, Auong the most commonly used materials in our world are iron, and steel, which is

THE WONDERFUL SIGHT IN THE GREAT FURNACES WYKING IKON YND ZLEEF

Minne furmeten at might, piercing the deckness with theit theit antican gressit an untorbiedin ppeciacle



m order to have the necessary equipment for duplicated what others had done before him ng made an invention 50 far, he has only betject' be would still be very lar from hav Now, even it everything he did had been manship was not what it should have been he made have to be done over for his work out to do Me finds that many of the parts and still has not accomplished what he set

By now our triend has spent some \$1,200

NOT MADE AN INVENTION BASEMENT BACHELOR STILL HAS

шэсрия сап ре ряд (tom \$60 пБ curate size with a milling machine billing at either end and then trimmed down to ac sponje pe cat a fraction of an inch too long is to be accurate and good tooking the pieces his problem The answer is that if the work, who knows about these things and explains accurate as it should be the finds somebody suddenly finds out that a hacksaw is not as length for the test stand Basement Bachelor typen cutting his angle non to proper

material amounting to about \$100 one bonne (snorper \$30) and mecellaneous a dozen gauges to measure pressures at tare then (ogg) arowament and not not signs to

At the end of this period Basement Bach elor orders majerial for the test stand—a lot mnen movey because paper is cheap HOWEVET these eight weeks do not cost too by six weeks of corrections and additions erand are the next step they are lollowed Two neeks of making diawings for a test

TIRE ARD MOREY

TESTING TAKES MORE the necessity of testing his rocket motor cast but he discovers that he torgot about now he begins assembly that is tun and nachelor will worth about them later kight na prirules kankes and calces and Basement dent beezz anence monnica with pe brosingen 120 but it is a nice sturdy and accurate rachelor orders a drill press it costs about drill is put away on the shelf and Basement trin for this cheration Reincrantly the 220 brest a blod of figures grouts bas (bests are this nork Unfortunately nobody s hands peantiful ejectric hand drill in anticipation Brement Bachelor has beught humself a pe quilled (entet Ceting who pay pecome the next step is that certain holes Lave to quiligants on entit line retresteds tristers

nell assume that our friend Garret is a per

some time during those eight weeks but

tric the would be inventor will give up at

trughle with machining operations is a

entist before he can even begin professional engineer or a fully transfer so the myentor nowadays has to be cuber a can no longer be made in the basement and tor teme and gloty But the new myentions made There is still unlimited opportunity Countless new intentions still have to be dustrial organizations of all history

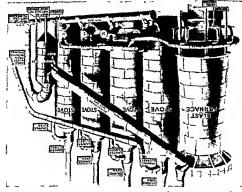
present war, but getting a usable result the MAS I FELD DEM Held at the beginning of the simble last pecause it is new. Mount physics And don't think that something has to be familiar with what the others have done practices first, and) on have to be thoroughly to subsore you have to know the standard practices or the work of others But in order prepuets uodn Butholdint to Busheno lo Most of the work of myenting grows out time work is too dull to make a good story ten up in books. The much more fruitful rou and because they are so rare they are will But such fundamental discoveries are rare

oetneen a horse stable and a potato cellar Cerman chemist Ostwald called it a cross norhing in a laboratory so primitive that the Scientists of the highest training and anima brimitie means Radium was discovered by tew people working alone and working with suboursus discoveries have been made by a counte matters it is true that some telly sometimes) different in the past, does not That conditions were sometimes (and only

burgaces acenits have known that team work is what really cinnes, at his disposal he would not have did not have these things usually called in ynow pow to psudle the equipment if he nave had the services of trained men who cutific institution, at his disposal He would spob camer of a commercial firm of of a ser pad a fully equipped laboratory or machine not even reach that point) He would have teed information (Basement Bachelor did its world have known where to find special pare prown in many cases, what to expect Basement Bachelors mistakes he would different Not only would be have avoided gin with things would have looked a lot if he had been a research engmeer to be

RESELT OF TEAM WORK TODAY S INVENTIONS ARE THE

secondary office hire hinself a professional machinist and go ittle martine shop, and it he is wise be'll int pe goes pare the beginnings of a nice beginning work on inventions of his own The stiff processe gravitation, the parent in parent in parent process at the stiff and the contrast of the stiff of the Contrast of the contrast of the stiff of



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or the Saugus River near the present city of Chief Opechancanough and his brayes mas tully Production began in 1644 on the banks nace was scheduled to go into operation was the first colony to produce from success town Yuginia On the day that the blast fur ruins that no tron "as found Massachusette Eall ng Elver sixty six miles above James as fragments of slag or cinder were in the men built an tronworks on the banks of the prelito nary tests nere made in the furnace to the year 1622 a little colony of English escaped to Jamestonn It is probable that

pe promisered into various suspes leable that is it can

nen bas nos si ino peratures are bigh man erann eagertin our modern blast mot I he tron from with low heat it is When from is smelled tural unplements harres and agricul their spears axes naking the mon for such a furnace for titye natives still use and Africa the prim in the jungles of Asia. furnace was made er and the shaft blast of clay became high together The walls done anay with al later the pit was



Charcoal or burnt

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TAPPING THE BLAST FURNACE



east (gross risque etc.) (Jeaney portar), etc.) to be define man ton be apply on the 11 carried up at 13th 14dde etc. The 12th 14dd etc. The 12th

iron became hotter they absorbed carbon from the chartosi and subcon from the stone-like impurities in the ore. Iron containing bees elements is no longer malleable and bard to fuse, but britis and easily melted Instead of

duced a great deal of heat in the furnace.

The reduction of the one will be the force, only faster, but force, only faster, the globules of

The plact turnsed of the forest turnsed and process of making process of making for the forest of th

product in the man utacture of coal gas, made as a fuel for coling

OI COFE COPE IS BUT in the manufactura tonpoid for a st sea to note that, while Rigitsalaiut et 11 there in tank cars. and the tar is taken piped to the mills tuels in making the tar are used as oplants The gas and the blast turnace cars and taken to ovens is loaded in tu tpe ph brounct The coke produced

mistument cases and automobile panels and a thousand cherr article, saccharne which is at times as sneet as sugar, dyes, meet times as sneet as times as sneet as times as sneet as times as sneet as times.

synesing of shoosing han ye we athom soft qessi soft to smod sologi dgraysts are it is bronien; enough of other manutation of the property to be such of against grassyness some own to be such of against grassyness some own to some of the property of the property of the property of the brase sees to seem the property of the property

Company American Steel & With Co. TAIR SXID

ractionaring overest and other apparatus where the most surprising chemicals are separated from the crude last mature. There are ammonium suppaste for fertulaser, beyool to mix with automobile

gasoline, toluol for explosives, napulpalene to

At the coke plants are stills, scrubbers, fractionating towers

ammonta and tar cost, but recover gas, more coke per ton or and not only make gas from the coal steel that distul the tures of firebrick and very intricate struc uct ovens These are are called by prod Degran to dulid what teenth century men este in the ninenould be useful, so 3: STREET STREET ininaces and under ui und osta binon the coke ovens, it 10 sdor our in mino trom coal would Of course, 1f gas

the oven Tains of Dawolls saw the figuons for tent sea mind fon bib teon and to the tent the oven Thateason to got adt ta mud of No navith saw tust cost contains partied and the gas part of the coal cost but in a strail charge to againe the tiom the previous white not enough Allenen dor san charged with coal at Decht'e otens nere adT a ridaad baqada the ancient dome its resemblance to double suggested by on sew nevo en! to summer add name of called a beenive coke

coped in highest coal peated until the party due to the time to a second of the party due to the making of coal east are driven off for Jears the coal was bucket in highest a subject of the party due to the time to be coal was bucket in high at the coal was bucket in high at the

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MAKING ELECTRIC FURNACE STEEL

The blast furnace has now grown from the ser eral years furnace remains in blast day and inght for

enther molten or as a gas Once hghted a blast gaetaquud bar nr tpe faunace comes ont cander notch, above the iron tapping hole at intervals through an opening, called a and floats on top of the fron Siag is removed called the non notch The slag smks down drawn off at intervals through an opening the bottom of the furnace and is tapped, or innestone, and so on The molten non such stole

then one of cole, one of iron ore, and one of Now the blast furnace receives a layer of curet unpurity in ore pecause time comb nes easily with stice, the on top of the motien from This comes about nurcecone in a mass called sing, which Hoars the turnace, the unpurities fused with the imestone were added to the ore and fuel in

In the early furnaces it was found that at mought to resemble a family of pigs runner called the sow and the whole was molds were tormed on each side of a central sand molds. It was called pig mon because state, it ran out as a stream of hot metal mot perug dug out from the furnace in the solid

rate bots and other utensils, stoves, frebacks hem was excated Some of the mon was cast come not be larged or welded So a new prob made an mon that was britile, of course it Since the blast furnaces as they grew larger watch everything about the turnace

watch the quality of the non, in fact, they the temperature of the blast, watch the side now it works The men who operate it watch The diagram shows the blast furnace and

the industry This practice is dying our of the owners The Eliza, Carrie, Lucy and Fabella furnaces has a been well Lacona in t ere named for nomen, often for the wives chout a blast furnace Not so long ago they trot the operation and such things very rarely side Now the engineers have learned to con chip and scatter ore dust over the county or it might freeze Sometimes a part nound undependable, It might refuse to make non the last few years the lurnace was sometimes a cery complicated apparatus Until wathin the equipment that goes with it have become the bottom or hearth. The blast lurnace and

a diameter of as much as thenty six feet at a stack about one hundred feet high and to little run of clay atound the top of a pit to



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The open bearth charge is not only molten to make the charge of the Bessemer con verter, but steel and non scrap as well Scrap is metal that has been used and partly wom

neat the incoming air valves are reversed and the heated checkers non, for about filteen minutes, then the at one end of the lumace across the molten Hot burned gases pass through the checkers sometimes the fuel under the charging floor checker chambers for heating the air and sucped roof with uptakes on each end and furnaces are shallow bearths covered with an the stort is more suitable for many uses. The controlled more easily than the Bessemer and upon the size of the furnace, but it can be eight to tuelve bours to make, depending special purposes. The open hearth heat takes until now Bessemer steel is used only lot ever, it cronded out the Bessemer process mee Mpen it did pecome earaphaped, now brocess, was slower in coming into general vented about the same time as the Bessemer

The open beauth furnace, though if was in The open nearth furnace, though if was in

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SLEEF IN A MODERN BESSENER CORVERIER BOW MOLTER IRON IS CONVERTED LATO

and burns away the impurities. of the air unites with the carbon in the mon metal in the converter, or vessel The oxygen through the tuyeres and through the molten contaming small holes A blast of air is forced tachable and fitted with tuyeres (ast pupes) height, and can be tipped The bottom is detrunnions (protes) about ballway up us end, at the top, open it is suspended on or signific beer applied petile with the small The modern Bessemer converter is a sort step in the bistory of the industry was taken non with air " He did so and thus the greatest I will price these impurities out of the molten putities removed and a little carbon added. source , greef is only east from with the un-In 1854 Henry heisemer in England rea

In 1141, 160-tel Humanon of Sheffeld, in 161, 160-tel Humanon of Sheffeld, in 161-tel humanon of the state of baser of blaster steel made when the state of the s

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packs up carbon from the charcost used for the stand becomes steel of a fair quality II be grets trued of blowing his forge and reals for a fulle white, the etter absorbs more carbon and becomes barder Three processes are basic to basis of all modern uson and steel making

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riant process of teaming—that is pouring molica siteline mouring molica is made in the picture is filling a hig spoot with molica and in a manufacture purposes. Both photon courtesy U & Seed Corporat on



that he can hammer it into tools The iron torge like a blacksmith s fire to soiten it so from the small blast furnace, he heats it in a none on bake 100 obtains his lump of non absorption of carbon After the native men Steel is a tarper pure fron hardened by the

months non in the nineteenth century vere made of amailer articles bibe and countless IIAGE CUL SYICE pridges, locomo pagsti K 3112 became well estabperiod before steel our an including Vevertheless it was 11100 present small scale at the broduced only on a PYrought mon 18 meented later making processes improved steet forced out by the it made It was wronght from that to sattitenb pood our Zumuers HOLMICH ខ្លួលបង្ហ furnace has about

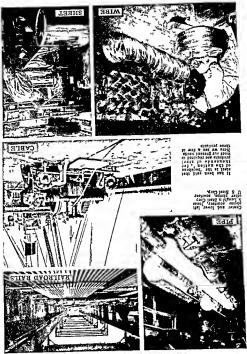
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and worked as desired, This ton that remained was rolled ploom The essentially pure was squeezed out of the and other unwanted elements containing suiteon carbon seis adi to tsoid shauoq cos otoom, weighing from 150 to ioned mto a hall called a siag. The spongy mass was it gradually became a hot with a long bar As he did so, dler kept staring the tron hearth. A man called a pudmass of pig iron on the from the cost passed over the porter the burning gases blast furnace As the fire grew stead of underneath as in the T DE DUS DOX 15 A SI QUE CUQ IU searth of another lurnace no miolisiq sai no juq from the blast furnace was process 11g fron 24 it can e NOR This was a cost heated

intrace for converting pig from into wrought Tu 1284 Menty Cort myented the pudding needed, and before long it was found

into a malleable form, for wider uses, was ner a method of changing the brittle iron and the little machinery used in those days (the back walls of furnaces and ineplaces)

The decremen process The big howis contained the charge are called converters



SLEEF IN WYNK SHYPES

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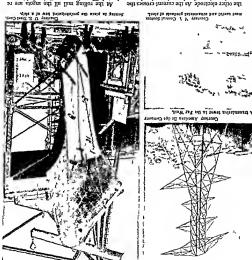
I KOM INCOL LO SIVB OF STEEL

After the ugot is formed and strapped of its mold it is almost always rolled A tery lens are forged under also are some and large shalls.

umportant seel products. They are used for railroad cars, locomotives, steamships, beavy machinery and artillery Cast steel has almost entirely replaced cast tron.

gap of ant, from the ofertored to the change, and again on the return journey, sparts are conited hie those of an old takinoned are and stanless and other special alloy steeks are taken to the electric furnace. Steel castings are loddy_one of the most

diamodol d'a mis-atre collega de diamodo, para de catars so trastico per de catars so trastico presenta de catars so trastico de catars de



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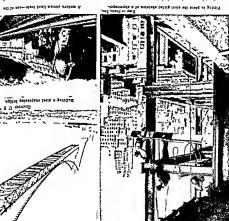
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down through the non and back up again to the iron in the bath current is sent from one, roof When the electrodes are lowered close to lustable electrodes projecting through the cylinder with a nearth for the steel and ad which is the type most used, is a squar pa ejectus carrent The Heroult lumbics ejectise furnace process. Here heat is supplied The newest method of making steel is the Jesz speel,

except the fine grades of tool steel and stam buthose is used in the open hearth furnace thousand uses Steel for practically every mills to be made into steel products of a ou sud the ungots are hauled to the rolling sheed by the mold The molds are stripped ingot molds. It soon solidifies into an ingot ponted through the bottom of a ladle man cost, After it is made the molten steel is ts pear of all, or it may have to be made from the coke of ens, it may be natural gas which may be part of the gas which was made at The open hearth fuel is gas, tar or oil It beams, plates and rails are cut to measure,

scrap, it comes from the leftovers when steel serap. The steel mills, too, make steel able These are among the sources of mon and abandoned, either worn out or no longer suit one and all kinds of machinery are being mgs' tails and cars are constantly wearing times form down to make way for newer build out. Buildings with steel sheletons are some-





SLEET IS USED IN MANY DIFFERENT WAYS

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Land can not progress it religion to used by government to control the thoughts and actions of uren But in Japan, religion has been a tool of government.

at learness on description and government in fact, be old showned by the condition and the condition working the fact of a condition of the co

The Japanese have never drawn a sharp of composite of the two religions rate of the Japanese people has been a sure eight centuries or more, the great religious tot bas anget at blod man soot membbud were willing to believe in Buddhism too 50 the Japanese who had believed in Shinto Suddhas, that 1s, perfect bengs, and that proclaimed that the gods of Shinto were true and of its strange gods. Then a famous priest they would have none of the new religion their ancestral spirits and to their rulers that tuen old tame of loyalty and obedience to medication But the Japanese were so used to right speech, right deeds, right hvelihood right and it consisted of right thinking right aims way of theing nas called the dightfold thath hie and to happiness in the next world This ueld out to the Japanese a way to spiritual good conduct is in itself a good buddhish Buddhism taught many things which were unknown to Shinto Buddhism taught that

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TODAT THE JAPANESE RELIGION IS A But 11 10 fest papurape alom e un st pur But an organized government, with its own with a nation of tribesmen into a community with continent of yels came to Japan, and changed Buddhism that the learning and skill of the nad never betore known 50 it was through me Jahanese arts and sciences which they with which the temples were adorned taught gold and bronze vessels and the silk labrics tendines out to anyour out the sculpiness trom China and Aorea to build magnificent Artists, engineers and craftsmen nere brought first and greatest period of Japanese art exist to this day from this start gren the dinst monasteries and temples, a tew of n bich the Buddhist priests He established Bud

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rule, that of the imperor and the first burnan thus the first emperor and the first burnan ancestor of the imperial family The legend was an effort to explain using the confine as changed in the state as claimed in the confine as changed in the confine as the confine as an expense as the state of the supplies of the confine as the confin

zuns Stu the god of storms was banished to earth for the near ena were brilliant with sunshine, but when dinaterasu came forth from the care her out This plan worked beautifully, and s strong) oung god should serve her and orms month of the cave Then they planned that carrosaly would bring Amaterasu to the pisted before the cave, for they thought that be done They decided that music should be met to the Any's // so to plan what could dark The other gods were worred they sett m a cave Instantly the heavens grew oun woo was a gentle spirit, concealed ner around was so unkind that the goddess of the treating his sister One time, the god of cure, one He took delight in teasing and mis the god of storms. He was mean and musthis is her story She had a brother, Susano-o, and " and seek the Hommull ofw strings sang o salkama which means ' the Great and Au goddess of the sun lier name was Amaterasu the Japanese imperial family She was the A opter tells us about the first ancestress of The first history of the Japanese, the means the 1/a) of the Gods."

god One spirit might appear to man as a mountain hondrer spirit anght appear as a hambagara ubitch means. All that exists is from the caster it was called Shinto, which spirit. Later it was called Shinto, which When there were doods or earthquakes or the cuption of a roleane, the staily lapaness the tempton of a roleane, the staily lapaness the family god was purely to the family god was purely the stail the stail the and bad, was thought to be some spart or and bad, was thought to be some spart or

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service-by the conqueror s need all know how hores was repaid for thus to lapan by way of horea as a bridge We lized and the Chinese culture spread slowly parbaric state when China was bighly civi nere is an itomic tact Japan was still in a Aorean art architecture and literature Non and minth centuries nero a golden age of nas the chief religion of Lores The egith cal sciences and philosophy Many Koreans were educated in China For a long time Buddhism which came by way of China Chinese art, architecture literature practi nie to pet' and was deeply influenced by) cars horea was an ally of China paid trib num me reum century not hundreds of the several kingdoms which were not united In very early tunes hores was divided pictures 1

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Of all Lorea's natural resources, water

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The climate of Korea is very much like that of the middle Atlantic coast of the et. United States but parily because of the et fect of the mountains, most of the ram falls

older find you be emontained, more stiffer and office find you be compared to the compared to

Typere is hardly any place in Aorea where railway system connects Scoul and Fusan on the southeast coast 1'art of the Aorean (Insen) The most important port is Fusan, the western coast its port is Chemulpo center or the peningula a terr males in from The capital of Korea, Scoul is in the שווהם שא שא' שומעום דעם כסשפר נש רשב שסגנשבשפר the Sovieta chief Asiatic port is only a few churia and the Soviet Union Viadinostol, north, on the mainland of Asia are lian east the Sea of Japan its neighbors to the to the southeast hores Strait and on the miles wide On the west is the 3 ellow Sea miles and is about 666 miles long by 130 Japan It has an area of about 84 000 square dips down into the seas between China and POLES IS S JOUR USIZON DEUTORNIS MINCH

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Under the Japanese, water power resources were developed, not not all did mines and worked, aluminum chemical and refung, work and aluminum chemical and refument to Japan The unprovement of industry went to Japan The unprovement of industry

nt the upland valleys nips and cabbage are grown in the north and wheat, corn, white and sweet potatoes, ter and millet, wheat, oats grain sorghum, buck summer Another southern crop is cotton water yield crops of rice during the bunid north or, during the winter, raised in helds most important crop, barley, grown in the of it to eat 'stost of them live on the second nese, the Aoreans themselves had very futhe nees the principal crop But under the Japa gree' eshecraffy in the south, has long farms whole families depend for hvelihood ery small, under four acres On such small much of its lettility Most of the larms are to bundreds of years has robbed the soil of tion of the people But intensive cultivation

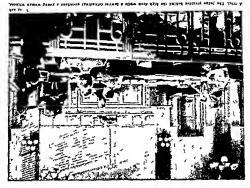
And I of Notes was once beauty Overeight with forest, but it has been used natefully in the south in the north, however, there have easily good stands of spruce, far, larch and pine in optie of the fact has a south of the property of the property of the nonnasimous, agriculture is the chief occupa-

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with some of the grant in school is familiar with some of the qualities that a lawyer should have First and foremest is a sense of honor Industriousness is very important and so is a fondness for studying and so is a fondness for studying

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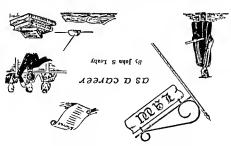
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paq to say on the subject Seward one of America s greatest law) ers you why you do it Let us see what, William nexed to be a criminal many people may ask become a lawyer if you defend a man bebersons who are guilty of crime When you stand how an honorable lawyer can represent Tuonguless persons often do not under

with a serious crime the right of counsel was the first nation to give a person charged represented by counsel The United States Jud every such person has the right to be he innocent until he has been proved guilty betson charged with a crime is presumed to in the United States and Canada even

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sta Peter exclaimed and I will have them There are but three lawyers in Kus lawyers were opposed to absolute power in a ment he learned moreover that in England hing Charles I to call a meeting of Parlia Excerces realized of all time had compelled learned how Sir Edward Coke one of the Russia While Peter was in England he enaged 200 of them to return with him to

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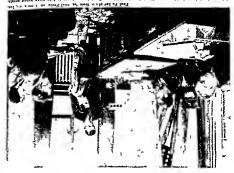
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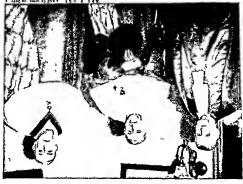
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a student was called to take his place at the students from the lawyers themselves. When to be an actual bar which separated the law in England in the inns of Court, there used diction. The origin of this word is interesting

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THE STREET

Cettern integration of our first but as also wight A floor, a table top, a building lot, a cotton plantation—all have both kengle and width To measure things like these; we are a unit of ores, such as a square loot, or an area of a square mid. Area is sometimes ealled square measure

One of the outst motorism the Eucentements to knell, the measure length when we find the outstand the measure length when we find may be very small, as when we measure a man for the measure as easter phaser. The weather or be greatly and man one notice of the principle be greatly and a seater phaser. The weather the earth from the safety had not be considered to the principle of the length as the principle of the principle between the principle of the principle contains a measure of the Centra in more party or Centra in more pa

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HOW SAINGS SAIN SAINGS Of course a grocer would protest most buterly if ne made him neigh out potations on a rocket ship a thousand miles above the surface of the earth, since it would take many more potatoes to register ten pounds at that

Besides, there are the distance between the weight a mouth of a more than the first considerable and the distance of the first constant of the distance of the distance for the second altitude is bruch greater than the first constant of the distance of the distance for the distance of the distance of the first constant of the distance of the first constant of the distance of the first constant of the distance of the distance

bance the vergible of an object of lifers as contains to a member of the contains a member of the man of the contains a member of the contains a member of the contains a praint of the contains a member of the contains a m

Careful to mean stands the same, But a Day of lead on a mountain top would scuths a little is a bar in example to the careful to the careful to the man pleasures it would be farther any from the center of the carrin II the bar of lead the arrocket shop has thousand minds and the arr in a rocket shop, the least would weigh arrive at rocket shop, the least would weigh a rocket shop the least would weigh a rocket shop lead to the carrier.

upon 11st mass mill de, that 12, the morest will wrigh. On the chief hand, the fasthers at will weigh, which conter of the earth, the less at will happen to be a certain amount of his decounts a certain amount of

The nearest to the center of the earth a family, and the earth in the family is, the stronger the child inpose it is in the object that is, the more it is in fig. 6. We still be delice faither it is

Line note each an object of the central half be the attraction between the the central half be the attraction between the the central to the central the central the central to the major the central the pull of the central to the major the central the central the the major the central the central the central the central the central central the central the central central the central the central central the central central central central the central central the central central the central central the central the central the central central the cent

THE POIT OF THE EARTH ON THEIR MASS

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and thickness (ogether (2 x x x 3) 'ne voi ume of the box is eight cuber feet. If ne wish to measure speed, ne take some measure of length and some measure of time

and the claims of contract (\$x \infty \text{if} \text{if

to weigh and meeting the meeting of the meeting of must lot different lands of meetings and time. Let as from the food as our unit of meeting lands of the food as our unit of the meeting lands of th

ALL MEASUREMENTS ARE BASED OF THOSE OF LENGTH, WEIGHT AND TIME If would be a terribly difficult task to learn

orpes things.

There are many, thouse youlder and There are small before are family careed to the blood by the parmet of the blood by the

The day is divided into themy four pairs, called hour, Jach bour led staticd in turn mo tarty and muture, and each minute and seconds and seconds the is as for 66, 400 hour of the time it takes the earth to spin around on the time of the time of the sumber 56,400 hour pairs of the firm at takes the sumber 56,400 hours and the firm at takes the sumber 56,400 hours and the firm at a for 50 hours and the firm at a for 50 hours and the firm at a first and the firs

So much, then, for weight, Anobter unportant librag that must be measured as tweportant librag that must be measured as twathread of the world. The truly sold on these of the world. The unit comes from the winning of the earth upon a sase the use the mord day to refer to the time about with takes to make a complete turn about

shitude than at each lete! But so last this suitstand has never come up Both the grocer and has customer are extremely to use usight rather than mass as a means of measurement in buy and with ething polarions and other bungs. So much, then, for metal thought the

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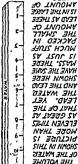
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The metric system is ever so much simpler than our own Take our various measures of the world has ever known the best system of weights and measures that elecur, amon is done generally accepted as the meter as a basis they set up the metric measure) It is about 39% inches long With called the meter (from the Greek metron or worked out the length of this unit which they

After careful measurements, they through Parts from the Equator to the North mallionth part of an imaginary line running I wey chose as their unit of length the ten

OH THE DRIL KNOWN AS THE METER THE TAKOUS METRIC STSTEM IS BASED

the other existing units of measurement. established but they did not accept any of of time the second which was stready firmly French scientists They accepted as their unit stem was the nort of a group of noted tem of weights and measures was set up This erepreenth century that a really scientific 378 It was not until tonard the end of the

OUR TRIBE OF TERSOR Betpet in the strangest hay, apparently with perfect The various units nere jumbled tomore accurate Yet they were still lar itum the course of time they were gradually made mes and tery unsatisfactory they nere, in stand has single of weights and meis

use Erest confusion again Each region de-After the fall of the Roman Empire there iagisa bas aignel lo in a temple They became the standard units

prouse her and libra were kept under guard come comes from this Latin word) The the libra or pound and this series as the unit of mountries and a digital for the abbreviation lb for I ped made a pronze weight that they called toot) and this served as the unit of tensur. that they called a per (the Latin word for over the empire They made a rod of bronze a sense of units that would be the same all embate, they decided that they would set up When the Romans established their mighty terent measures.

Unfortunately, different regions adopted dif-SERVICED RELE TREE IN OTHER SUCIEDI CONDITIES trans had such a system and that similar causte units If a know that the ancient LETPsenses of weights and measures based on ac ments of the earliest times gave way to a He do not know when the rough measure

than ever belore have a far more satisfactory measure of length ments, it is clear that these people nould and to use these sticks in all their measurepare other sticks of exactly the same length

persuaded his friends and neighbors to pre and used it to measure his helds. He then He prepared a stick as long as his own foot of length the human toot any human foot ago became dissatisfied with the old measure Old So and So, who lived thousands of years Probably something like this happened

factory to use measures that would never men found that it would be much more sairs as that made by another As time went on by one plowman might not be nearly so long much longer than another a A furrow made ery mexact. One man s hand or foot may be a human toot or the length of a furrow are Of course measures like a number pand, or

made the upfull mile shorter! harder to nalk uphili than downfull, they an upful mule and a downhill mile Since it is single day s journey. The ancient Chinese had the distance that a man could travel in a or the length of a lurrow made by a plow or measures the human hand or the human foot, ones were rough and ready lien used as out accurate units of measurement The first it took many centuries before men worked

no os bus at 15 m th units of area and volume and time, whether it is measured in Boston, or New York, or Chicago or San Francisco And so a unit of measurement A foot is a foot sug ue sug sn) ont triends secept the toot as wide, there can be no misunderstanding. I ou to be so many teet long and so namy teet gan it 2 on tell the architect that the bouse

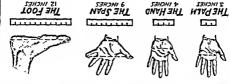
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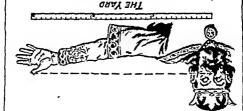
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nave an entirely different length of cane in of cane for the measurements while you mught Therefore 5 our architect might use one size canes Lanes are of many different sizes canes taid end to end and as wide as twenty tect to build you a house as long as forty units that all people will know and secept. from these three, "e must have a senes of time of the measurements that are built up

YOM IN CAICULATING TENGED OF MEREDE, OF of gravitation the height of one foot and one pound acordupois against the torce toot pound is equal to the nork done in rais iculty sud the pound a unit of acress The to from a foot and thor some a unit of want to measure energy The unit called the hundred 3 ards in ten seconds Or suppose he en nour we say that a last tunner can go a We say that Bill Jones can walk three miles

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DISTANCE FROM HOSE TO BE SOUL WEERES OF PENEUR.

(EURRON-LONG: LENGTH OF ONE FURBON.)

THE FURLONG

Shoe saxes are reckoned by the old messure called the outsycorn, which is equal to a third of an anch. A size to shoe, therefore is an anch longer than a size y since. The barley com is used in a system of thurteens. This

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AND STREET WE STAND SHOULD IN ANTHONE IN A STREET OF STREET STREE

tions are rare. penul ednes to 14 bounds tint such excepwonid say that he weighs to stone, a stone Smith weigns 140 pounds An Englishman l or example a Canadian nould say that Mr and measures, except in a very ter cases Empire, she uses the British system of weights Since Canada forms part of the British in greater than the American gallon ditter suchtly The British gallon, for maisnee, pation, Now American and Bruttsh systems employed in the English colonies of the come a and measures are much the same as those use the metric as stem. The American weights ever, scientists everywhere in these countries sent use the old weights and measures, how The United States and the British Empire older systems.)

The meter system are accepted by Fine a 1995 since that time to the control of three for the control of three for the control of three system (Some of the countries also use the the system (Some of the countries that now we metter weights and measures also use the older system.

a centilitet la 1/100 of a liter, while a kilogam a 1,000 grams, in the case of square messures, the word are ta used for 100 square meters, the word are ta used for 100 area or 10,ooo square meters. who was the other the most to be based of the control to be based of the most of the control to be based of the most of the control to be most of the control to be contro

And so we have the following system of deciments in make a cent mate of length to multimeters make a consistent make a meter, to commeter make a meter, to becometers make a bloweler make a meter, and the make a meter make a factor of the make a meter m

These prefaces are dec. (1/10), conf. (1/10), conf. (1/10), milli- (1/100), all it.knt from the film, and dece. (10), becto (10) and film, and dece. (10), becto (10) and meter, become first, become first, as known from first, from the 1/10 of a meter a knowner, as knowner, as the meter are used for measures amaller than the meter first and for measures amaller than the meter first first

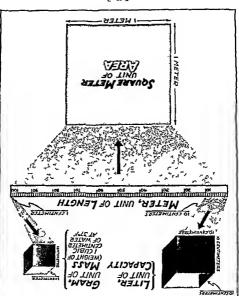
A meter them the child miss of childs, and child and chi

rockoning a mode ampore in the mettre system. The meter is divided into ten pasts and so on The is called be decimal method and show the past of the pasts and thoughout the hole method system the decimal method is used American and the decimal method is used American and and decimal method is used the past of the decimal method is used to the hole in the past of the past of the past of the decimal method is not a past of the the past of the past of the past of the and the past of the past of the past of the and the past of the past of the past of the and the past of the and the past of t

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The Meter as the basis of the Metric System



called the light year is used. The light year Lot barricularly great distances the unit must is edual to nearly 93 000 000 miles. adopted The measure called the astronomical

nres of length larger than the mule have been even an astronomer! Therefore several meas be so long that they might well discourage miles, the resulting figures in some cases would

and Measures Service, Sureau of Standards in Canada the Weights possible In the United States there is the mergues and measures are kept as accurate as

ment agency which has the task of see ng that every county therefore there is a govern me see she to vary just a bit in practically other things with which we weigh and meas

Now rulers and scales and containers and If they measured distances only in terms of You will find it interesting to use the table on the next page in order to chack the accuracy of the pictures. 200 KITOHELESZ

LOO METERS SUBAN OOI IO INCHES 28373MTN333 OI ar a late to be to be

with ours

How the METRIC SYSTEM compares

Vatronomers often use very dig numbers. button that is \$4 of an inch in diameter one speaks of a 30-line button, one means a Buttons are measured by trace, cach line is equal to 1/40 of an inch. Therefore when

t dira nuege revolle enged tud bi of ng spoes by barle, corns, one does not go on means that when one reaches 13 in measur-

There are many other kinds of measure-SOLUM GOOD settonomics units of about 6 000,000 000 second & light year is equal to 05 700 the speed of fight is about 186,230 miles a -s really respectable distance, seeing that is the distance that light travels in one year

ments besides those that us have given here

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HOW METRIC WEIGHTS AND MEASURES COMPARE WITH OURS

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TABLE OF WEIGHTS AND MEASURES IN COMMON USE

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assistant to a doctor already in practice years as a resident in a hospital or as an a specialist, he must serve tor three or more take care of them binally, it he wants to be as hospital and helps the older doctors to an meetistip during which he sees patients bicierably eighteen months or two years) of tion titer that he must have one year (and he must have four 3 cars of medical educa that his real medical training begins tust a bachelor s degree at the end of them After tion Three or four Jears are preferred, with and not less than two years of college couca school education a high school education ing At the very least, he must have a grade has to look forward to a long period of train quetots par sus bonus student boy or gut States there are many successful women who wants to become a doctor. In the United LOGSA (pe was is oben tot and pol or girl Агеязоры эшерэц

About the time when Peateur discorrered in the other center cause disease, many of the other gent or make tremendour advances him greet the make tremendour advances him greet mouran hondredge a much longer course of study in medicine

of dead hodies in order to see at first hand the changes that disease makes in human the clinics and he would go with a doctor already in practice to see patients who were

members and a property of the property of the

пэшом the country where all of the students are burs Turs is still the only medical school in ical College of Pennsylvania in Philadel homen was organized-the Woman's Mied est the first medical school exclusively for Medical College This is now the Syracuse University College of Medicine The next Elizabeth Blackmer from the Ceneva noman in the United States was recented 1946 the first medical degree given to a ont Eugenstiy the number moressed in a rew coursgeous women attended them their students were young men At hist only of medicine and by far the greater part of After a while there began to be schools uorssa

THERE has once a time when a bow who were a bow who were the color necessary fairs and occur when the went the color who was already in practice. In those doctor who was already in practice In those with a work of the color who was already in practice. In those with a work of the color who was already in practice. In those was a present the color who was a present the color who was a present the color who was a present the color was a present to the color was a present the color wa

An old time country dector s office

Morris Fishbein, M D Editor Journal of the Imerican Medical Association

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and experiently or paracection bare been clearly to proceed the same to thousands of years Medican the came to the oldest of professions. Brillaire, Cushing most famous of brain surfaces of the oldest of professions of them surfaces of the oldest oldest

or an obsortunity to practice properly qualified can be reasonably sure nom a good medical school and who is saleubary one nomina or nomina who graduates needs of the nation for doctors bor this rea cine is ecidoni more than enough to meet the tendance, the number of graduates in medinecause the medical schools limit their at he hest qualified for the study of medicine choose the men and women who seem to it means that the medical colleges may ecpools. This is probably a very good thing than can be accommodated in the medical decide to undertake the study of medicine to be doctors in fact more soung people of found men and a number of women decide work and expense involved, great numbers Every year in spite of the time hard

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through powerful microscopies time of the trents of the best, as wen the maked of a and he absistudies the atruceinques igne eitmeime se if een pie seen po structure of the normal human body lie of the grant a the rough understanding of the macopoli pristomy offers h m the chance rent pare Admorred Comore the Competer prequire pe concentrates betteentally class Once the student teaches the study of france on ones feet and speak are required and composition and even in the ability to medicine so courses in tenglish triumar one's self well is fundamental, to success in Renninged in Traini The applied to express on is is entile banked ife must be well in acutor to anatt to enden act and curers medicine must learn in read easily thermore the joung man or wanten who equally vital to a medical curricu uni Fur dependent has come in be recognized as ice abou which the science of physics is so are fundamental flore recently mathemat motors by sice and brunengin encurity which help to develop his scientific sense guq in contege he should choose subjects some courses in serince Bold in high school medicine it is customary for him to take secore a bound leason begins to study

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create the Last as a statement in the thoracter and correct which the body use a substance called interpretable the body as a substance called insulin matter the enthicially supplied The insulin undoes the work which the practices about does the work which appared to the proposed to th

Certain diseases are definitely related to the bedy the bedy the certain of some of the testivities. The pain certain greates an example. This gland is some certain with the way in which the body uses sugare. If the paincress fails to act proposity

barr or the study of medicine bullasopoka entrition has become a rital science of nutrition which has its basis in This knowledge helped to develop the new or calcium and phosphorus results in rickets neuring and a lack of vitaming A and D or sem a fack of thismin leads to heribert of with disturbances of the eyes and of the associated with scuryy a lack of vitamin A diseases For instance a lack of vitamin C is or proteins in the diet leads to deficiency certain vitamins or of certain mineral salts eary substances in the diet A deficiency of man sometimes fails to secure certain neces nonever that as civilization has developed tian must eat to live It e have learned enecine piologic remedies and the antibiotics ogy and serology and the development of the der ejobinent of pacteriology are immuniol lundamentals of this science Related to the day every medical student must learn the sengies came the science of bacteriology To spons ble for unfectious diseases group these

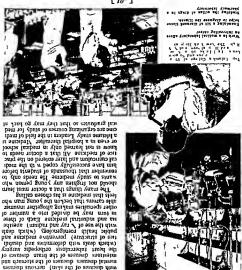
expression of some action of a higher bower on man Gradually physicians learned that diseases rose from specific causes Pasteur showed that there are germs which are re-

te sen escapit that all disease was an enects against intectious discases. qeaqly germs in this way they exert potent suripiones beeent the growth of certain AN EU SUS SECLETIONS OF THE BUILDERS AND AND US US Liese melude penicilin and streptomycin e ue ae pare que aouquin uea surponce usua as the great triumph of modern mediagainst numbs and scarlet ferer And, h need against smallpox and the moculations antitovina against diphtheria the vaccine eques and breventive materials such as the old botanic gardens are modern biologic rem and produce anesthesia A far cry from the drugs which stop convulsions relieve pain Authoric chemical laboratory come sedative acetamild and the sulfa drugs I rom the make such drugs as aspirm amidop) rine and many other substances are put together to elements and derivatives of coal tar and Emmuke in modern chemical laboratories has advanced far beyond these simple beOne bundred and fifty years ago medamed depended wherepally upon the botaner grander of the first part as superner and the best of the best quantum which is a special for the best quantum which is a special for mainra and bediadonts from which are the mean which we have a first and the proposed by the property of the

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buy stology Authion has become a tital science of autrition which has its basis in This knowledge helped to develop the new of calcum and phosphorus results in rickets neuritis and a lack of vitamins A and D of skin a lack of thiamin leads to beriber or and desturbances of the eyes and of the associated with scurvy a lack of vitamin A diseases For instance a lack of vitanun C is or prateins in the dret leads to deficiency certain vitamins or of certain mineral salts eary substances in the diet A deficiency of man sometimes fails to secure certain neces nowever that as civilization has developed Vian must eat to hie 1/ e have learned specific piologic remedies and the antibionic

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more money for working in fictiones than these factories. The people would be paid lidud claics promised to help build saff recreet transpersion to the continern reput hes miustrics and more factories would bring the common people of Latin America, More dies that more nays could be found to help One of the great hopes of the conserner

ste extremely poor sport the millions of Latin Americans who In his opening address, Padilla talked mouten

FROMR 3> 2 Strong supporter of Pan Interto becquee t'adilla and he has long been elected president of the conference. The name Mexico a Minister of Foreign Atlanta was

saiety of all imerica when co-operation was vital to the burn't me tesuit of tessons featned from the held The good feeling at the conterence was successful noter interican conference ever The Mexico City Conference was the most

Cerniany and Japan them were lighting to their lives against needom 4t that very moment many of tions know what it means to struggle for the had lought so many times timerican na how proud Mexico is of her liberty for which Conference It helped them to understand minder to the delegates at the Mexico City the story of Chapultepec served as a re-

on Problems of II at and Peace it is called the Inter American Conference

of as the Mexico City Conference O neurally cen republic. This meeting is weally epoken out the representatives of almost every true g the palace was used as a meeting place "us than ever brom beliusty at to March in 1945, Chapulteper became more fammicel states troops under General Scott

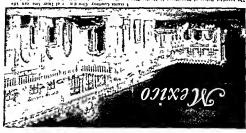
century ago, Chapulieper was taken by tue Abantards ander Cortes Just about a beiors in 1519 the height was stormed by excame a favorite resort of the sales em till as a fortice and a bulwark Later, it ductors, the early Aztecs chose Grassin pper Long before the coming of the 'pam-h con cushnuchee has had a stormy bistory

STOTUTE STOR apoleon 111 of France and other dreamy apo as cent to Mexico as emberot, ph residence of Maximilian, the Austrian prince eighteenth century At one time it was the The rambling old castle was begun in the

(Lobocatebett) and Ixtle (Ixtacthuati) in tmenta, affectionately called mits of the of the most famous mountains cathedral Far beyond the the snowy sum reaches to the central plaza with its great dens and beautiful buildings Ihis avenue a wide avenue lined with statues, flower gar capital From the portico you can look down paiace has a magniticent view of the Mexican rateca called Graspopper Hill The famous City stands on a high bluff which the HE palace of Chapultepec in Mexico

Author of Latin imerica its Place in World Life by Samuel Guy laman

The beautiful Pataca of Chapultepee in Meates City was the meeting place of the Juler American Conference t ceuren Courteny Co-o dn r of Inter time can tita





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There is one general rule 11 you wish to become a great singer and it you have the there is not the very best training possible.

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standing original musical works the most

known before. every thing musical than the world has ever there are creating a greater market tor practice to appreciate music through radio music, There are other millions who have come good musicians and who are buying septoops and colleges who are learning to bebefore There are milious of children in our nicher incomes to vinerica today than ever more tully employed musicians receiving thu country, the fact remains that there are one) part the opportunities for nusicians in tios even etrom baues edt bas eiber 1541 If pile there are some people who believe the old kind of pliano and sheet music store prizmeez in a confunuity too email to support mide awake music dealer can have a thriving

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Courteey Metropol tan Opera

Methopolitan Opera stara Salvatore Baccaloni and Eric Pinza in Ressial a Barber of Seville.

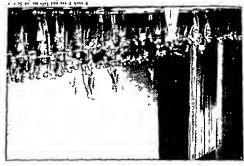








This noses on the stage of the famous Paris Optim is dismade but not-believe. Lily Pone, coloranization and acting of Paris on Lucine It, 1944, and take freeing of Paris on August It, 1944,



nete Robert Merrill baritone of Brooklyn Metropolitan Opera Presents The winners in 1945 the auditions were renamed. The hork as a result of its annual radio contest Four young singers won awards from the cent of the cost is raised by gifts

a nitte more than two-thirds and 3t per cent of the cost of operating the orchestras lege of putting them on the radio pay 69 per sors and broadcasters who pay for the privi the orchestral concerts and the radio spon pined surplus of \$27 552 People who attend prijantitopists and friends of the orchestras 21 130 820 which was offset by gifts from 22 22g 2go pure jest a computed denct of 23 grd 636 The operating expenses were orchestras had a combined gross income of are cery important in paying these costs. The Cattern to sitted sastradaya tradi fasin seriesata now enough it sometime to thouse how or the unancial report of these orchestras

and are of the players are nomen members have been in the armed services Truce hundred and eighty has former englicen otchestras employ 1 513 musicians their annual meeting in Alay Altogether the proud occuestive of the United States held

The managers of eighteen major sym the conductor of the Detroit Symptony rector of the Kansas City Symphony was tional network hard hrueger formerly di sponsored a series of broadcasts over a na get back on its feet Mr Reichhold abo denerously beiped the tletroit Symphony to rescribing an industrial che mist of Detroit cecquit the late Albert Stoessel Henry H new director of the horcester Festival suc Symphony Orchestra Walter Howe was the setts) annual Fall Festival and the Detroit among them were the Norcester (Alassachu casualties came to hie again Prominent in the United States a number of war

Kussia grad Philharmonic has traveled throughout War Relief Since August 1941 the Lenn Philadelphia Orchestra through the Russian inflarmonic Orchestra by members of the soit This gift was made to the Leningrad μπωρεί πουιδριετές απά οισει τοισβά οι του year was a subment of strings reeds bows guts sent to Europe by Americans during the pn's musical equipment and so among the turopeans found it almost impossible to Sum 4

in the same boat as the rest of his fellow by the war Sibelius said that he was merely

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One acceptance in all roots of the control of the c

CINCRS zame atternoone all of them drew large au iour of these orchestras were I laving on the certs on Sunda) afternoons Even the ugh su asdeloup—gave regular subscription con toure the Colonne the Lamoureux and the known exchestras in Paris-the Conserta increase soldiers and officers four well Obers Coundne-Decame popular the opera houses-the Opera and the of course removed after liberation Both of neen in Senbathy with the Germans were ROLLING order The few persons who had tion and the regular organizations were in good shape at the tune of Frances libers well worth while The theaters were all in differuties but the result of their efforts was French music Josets Nor'ed under great

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members have been in the armed services Three hundred and eighty five former estricen oscuentas embjo) i 213 maicians their amoust meeting in Asy Altogether the promy orchestras of the United States held 125

your sa s ceans of its annual radio contest Four young singers won awards from the cent of the cost is raised by gifts a little more than two-thirds and 31 per cent of the cost of operating the orchestras lege of putting them on the radio pay 69 per sors and broadcasters who pay for the privi the orchestral concerts and the radio spon pined surplus of \$27 \$52 People who attend STREETING TO \$1 758 502) teld ng a com philanthropists and friends of the orchestras \$1 130 020 sepicit was offset by gifts from \$2 22g 2go Line left a combined defict of \$3 827 639 The operating expenses were orchestras had a combined gross acome of are very important in paying these c sis The cycetess meet their expenses bitts of money med interest you because it shows no y or The financial report of these orchestras and 210 of the players are nomen

were Robert Merrill baratone of Brooklyn

Metropolitan Opera Presents The winners

in 1945 the auditions were renamed. The

in the same boat as the rest of his fellow by the war, Sibelius said that he was merely

grad thinharmonic has traveled throughout War Kelief Since August 1941 the Lemm hiladelphia Orchestra through the Russian hilharmonic Orchestra by members of the bergman and of shem sew this still free trumpet mouthpieces and other things of that set was a shipment of strings reeds bows guts sent to Europe by Americans during the pak maries edulpment and so smoot the Europeans found it almost impossible to

the managers of eighteen major sym the conductor of the Detroit Symphony rector of the Lansas City Symphon, tional network hart hrueger formerly di shonsored a series of broadcasts over a na get back on its feet 'Ir Reichhold also Scuctonaly beloed the Detroit Symphony to rescripted an industrial che nist of Detroit eceding the late Athert Stocssel Henry H new director of the // orcester Festival suc Symphony Orchestra, Il alter Hone nas the setts) annual Fall Festival and the Detroit among them were the 1/ orcester (Massachu casualties came to life again Pronunent In the United States a number of war Kussia



[118] Tale scape on the stage of the innex Paris Cebru in dramatic bot not make-bellave Lily Sent. talerating, is slagisting to the first schalerandry 1966, of the frontag of paris on August II, 1966, and allegated of a Calebratica of the first schale.

AGREEA and Sulow Boat (November 11) many ait musical scores including 508 % Acem, composer of Or' MAN RIVER and of LENIA KLSTRCANA (August 2) and Jerone secto Mascagni, Italian composer of CALAP (Gred in Paris, day and month not known) 36), Molas Tcherepain, Russian compoet ing 1945 are brio Rapee, music director of the Radio City Music Hall, New York (June rour well known musicians who died dur with her husband, Henry Johansen

occupation Mine Flagstad in ed in Norwal) Montana, if not to sing During the German States to see her daughter, who lives in that she would come back to the United briegt in 1941 Mine Flagslad announced York a Metropolitan until she returned to had been one of the leading stars at tew Austen Flagstad, the Norwegun soptano

wonid sing about 200 different songs treat in a single season on this program ne Star, Laurence Tibbett Tibbett estimated in Jamesty, 1945 by the opera and concert regular featured soloist, and was succeeded rarace 'program, on which he had been the int songs, left the Saturday night in Frank Smatta, the nell known singer of

ing and the swooning! sudicince could hear the music for the shour SYMPHONY, neither the conductor nor the he asked, it, during Beethoven's MINTH shricking and swooning, and mass hysicita among young people." What would happen among people " What would happen and the state of the mon practice of encouraging screaming Shaw was particularly scornful of the "com in the wartime appetite for popular music

Shaw ' have found a market for mediocrity A lot of incompetent bandleaders," said but nevertheless they were sold and sung 1945 as it had been at the beginning of the ciaced that ' not' music was not so good in Artic Staw, the popular bandleader, de-

> TO LISTEM OUIET, PLEASE! ARTIE SHAW WARTS YOUNG PROPER

I LEMP TRISCE WAS THE CONDUCTOR Piotoss Symboony of the Au' program with the VBC Symphony on the General and appeared on September 23 as solution Heights Ono Each was awarded \$1,000, Tirs Kobert Weiskopt), of Cleveland and the other was 23 year old Eunice Fodist Laula Lechner, dramatic soprano, who 24 1943 IN Yew York One was 21 Jear old tional I ederation of Music Clubs, held May winners in the 1945 auctions of the Na Two toung artists, both from Unio, were

still playing to expecity as 1945 coded to the Martin Beck Theater, where it was hit shows Ov THE TON'N was Liter moved York it soon became one of New York's produced at the Adelphi Theater in New EVYCK ESEE WITH MINSIC PA DELUSION MES collecty-On the tony-based on out" houses On December 28, 1944, 2 musttian Opera House where it played to "sold duced by the Ballet Theatre at the Metropol played in New York during the preceding season, and his ballet FANCY FREE, was propest ouchestral nork by an American to be 1044 MIS JEREMINIE SEMPROUP WAS VOICE INC us aler sassages sig of Suippe gage seg ratinonic 55 mphony (November 14, 1943), Waller as conductor of the Act 1 or 1 This wenty nie when he substituted for Bruno the age of its small nabbus barains of Leonard Beinstein, the Joung musician

gramma soos ecuorations tenor, of Sault Ste Marie, Ontario, and Piertette Alarie, soprano, of Monitcal, were lowing season Joseph Victor Laderoute, check for \$1 000 and a contract for the fol tenot, of hansas City Each was given a New York and Thomas Tibbett Hayward,

Refolict and a guardeonn in Copenhages Deamsta.



selling had been a major indexistly for the distribution of the di

of labor had come to stay and buying and to make things for each other the division cir firzed world flore and more people began demand for things increased all over the could afford to buy shoes for instance The buces Fonet buces meant that more people cost lor labor Lower costs meant lower much less time and at a greatly decreased the creation of many new commodities in shoes but did it very fast. This resulted in machine that turned out a single part of the s bebasi ment a first to finish a man tended a to ried a gardean to besteat assisting a little power and animal power Labor was divided espenently gream took the place of man the work of many men and do it much more chines were invented in those centures to do uneteenth centures As we know many ma querust Recommon of the eighteenth and commodities. The brought about the in demand for goods and soon producers were As Usde and commerce grew so did me

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die men and so help us to obtato a better nin to taurand and souber this montesines to prove at is true however, that better or sees rendered While that would be difficult say are entirely disproportional to the serv broduct into our hands These charges some cover the costs of getting the completed deliar we spend goes to the middle man to the average fifty nine cents out of every times the cost of producing it Actually on goes into your automobile tank sells at three lather for \$8 and the gallon of gasoline that cosmus \$4 to broduce may be sold to your grocery store for five cents The pair of shoes ior one cent is sold across the counter of the bians because the bunch of carrots he sold may for example hear a farmer triend com consumers spend goes to the distributor You a considerable part of every dollar that

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WED OF LIVING DEPENDS ISR INFORTS OR MRICH OUR STARD-

sell some of these goods to hungry turings mote wheat and cattle than they can eat and tioth Canada and the United States false United States and Europe which need them and can spare wood pulp and paper to the Canada, for instance, has immense torests modely than it can profitably use at home way produce much more of a particular com come medependent of its neighbors A nation anccessingly broduce enough supplies to be-Under the modern way of life no nation can that have been produced in foreign lands every province of the Dominion use goods tue beobje in every state of the Union and part of Canada produces something that the people in foreign countries want. Libewise Every part of the United States and every

AMD THE UNITED STATES EXACRIS ABOM CYRYDY

though it imports from outside its borders exborgs a connexy is able to pay for the many piles sod typewriters By profits from its many manufactured goods, such as automo raised by her farmers. This was also true for more than 30 per cent of the toodstutts the office supplies produced and slightly ber cent of the tobacco crop, 25 per cent of exhoused about 30 per cent of her corton, 35 tues need Belote the war the United States commodifies that the people of foreign coun ednyff fanc that we produce a great many we need must come from foreign lands, it is ching for the true that the true town their can has by track Foreign trade is impor sons taught by the war is that no county One of the many terrible and costly leson paper made in Canadal

eq prates to , pnh vmetican, were brinted new-paper articles urging people in the Unit

ing to the United States Even some of the ada sells leather for shoes and wool for clothdependent on certain foreign countries cancase of clothing most countries are partly when the natural rubber is used Even in the of chargette tubber cost much more than vent a rubber like substance But tires made rupper comes Rupper tires became very East Indies lands and islands from which sonice of tupper when Japan stinck at the You will remember what happened to our

This sugar may bave come from Cuba coated with tin. The tin came from Malaya modules may have been packed in cans ica, or possibly from Africa. These two comcocos may also have come from South Amer Colombia or Brazil in South America The while you had cocoa. The coffee came from conurtly Letyabe four baseurs quant consec had produced within the borders of your own Do you remember what you had for

LUBIES COME LEON BYS TURDS SOME FOODS ON OUR BREAKFAST

pn's out's the goods it produces itself tet along if it were to follow this advice and let us see how a great nation would really HI toreten goods should be shut out Ivow gome beoble even went so int as to say that other countries for the necessities of tite was so, it was not necessary to depend upon were many people who felt that since this wealthy country Before World War II there The United States is very large and a very trade are widely spread

thousands of workers. The benefits of world nousemen, and gives employment to many able to shipowhers, merchants and natetisde in such things as these is very profit nemb' late pides, rubber and rvory The woot res, cocos, rice spices, tobacco cotton broducts of many toreign countries, such as come the greatest market in the world for the Great Britain, for example, had by 1940 becommodities which it does not itself produce country arises from successful trading in "Yo small part of the nealth of a modern

THE PRODUCTS OF OTHERS ONE COUNTRY MAY DISTRIBUTE

tant to your health and comfort middle man, the dealer is very, very imporwent through such an experience, that the and you may have slept on the softs in the living room. You can readily realize, if you cided to close some rooms on to save neat, Achiese Generary not il easy would cooper sease in that plan, preferring to be, if they could independent of the rest of the world. They soon related that this polary would be also also the could be also that the to obtain a colony that the polary would to obtain a colony that could be forced to the polar that the could be forced to many subject they have a colony that could be the could be also that they are also many adopted the same procedure under that they have a some procedure under that they have been a some and the same and the could be a some and the same alles another of the regishoring coun

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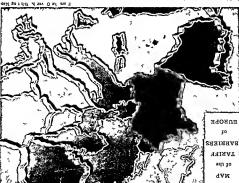
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Conference held at Bretton Woods New wil representatives to a world Economic th the summer of 1944 torty tour hattons

Sylere to siergims or psylor Deobie who won the cuere they would be buseut put not enough to support nat the quantity of food could be raised than at and should he put to foreign trade a greater with manufactured articles Probably if an ont pri's tood with coal from its mines or it broduces nardly a third of the lood it eats country with a large population for its size DE MUCH WORSE Creat Britain is a small Wanniacturing and trade conditions would

Trong to ano tracers out or pinous aidoed to bite up ractories would close and multions pe much discomfort Surplus goods would sqoping such a way of hie but there sould the Soviet Union could survive longest after county like Canada of the United States of flone cut ou from its neighbors A targe again tollow the stuy notion that it can stand

It is to be hoped that no nation will ever Anisod Suoza z uons 10 nins great suffering that resulted from the pur of all know the terrine loss of the and the bliow and to test on the expense of the world servitude find Cermany would be self suf nations reduced to a state of agricultural ntacturing center of Europe with the other Germany become the great prosperous man rice of Europe Hillers plan was to have



100EF 10 passing year sees an increase in the division abou escu ofact Kemember also that every of labor the more dependent men become remember this the greater the division trade and fnance

great step in co-operation in international a resort pear if it is adopted It is at least a monater aut 1891 180m Junit appen uaari ments of the forty four nations A start has persed upon and approved by the govern

Refore it can become effective it must be become the world as a whole would benefit the belief that if they could be made pros HOUSE SIZE DE LOSDECT TO DECLARICA TISTIONS IN nesp nations temporarily in need Money on Altrage pool up pauroj ag pinos jood agi common boot 11 ben necessary money from by the nations The money would go into a be created through contributions of money national Stabilization Fund This fund toning tue office derice proposed was an inter

TO RECOME PROSPEROUS A PLAN FOR HELPING ALL MATTONS

tions scattered all over the earth problems of trade and commerce among na this of course would greatly simplify the connected with international trade muse go through which all hnancial arrangement det sees The first was an International Bank ye musich soobted the plan called for two

too extreme to be accepted curn cly new pane he adopted The idea was isbed and an international standard with an the dollar and the pound sterling) be abol monetary standards in each country (such as many ideas were proposed. One was that the betore the definite plan was drawn up Cooperation

the Bretton Hoods Plan for Horld Economic conference drew up a plan, it is known as usade and commerce the delegates to this on nonnegado-op Ad st Angadeoud pipou a ves Believing that the only possible way to nongrajo eo

bouch respectable The opposite policy is and economic self sufficiency Ite call this do every thing possible to promote political money pe to stay away from each other and last seen that the only way to have peace the great nations seemed to think as we have some unfortunate things happened Many of FOR Know from your history that after 1915 coming of peace that followed It orld It at I want to see the same mistakes made with the lon bib enotien ynem in erabes! bne negel been made in the war against Cermany and Hampshere By that time much progress had

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ment we who live in the eastern part of cast of where you are standing at the mo one sease it is any part of the world which is ne shear of the East, but where is it? in

sianodai Buno Cano Bumina astomishment a school of journalism in Cairo her pyramids, but the Sphinx views with modernized industry Egypt still possesses see which shall make the most out of its men diplomatic patrics in its old palaces to Iran, and the British and Russians fight the mystery of the Orient. Persia has become Our two world wats have almost destroyed

parerado which uses the water power to turn the long quest may now be the site of a factory in India where hims Holy Man ended his relebrate a victory The banks of the stream zoure mu where kublai khan paused to ber husband Bombs may bave destroyed retinue of slaves as she journeyed to meet rested in her palanquin surrounded by her through an oasis where once Scheherazade be a cluster of oil wells, and a pipe ime runs with his trusted tizier beside him, may now ouce fortues ed on some fattastic adventice force in the romantic fiest, where a sultan the grimness of war has struck with full

than the world can ever replace and war itself has destroyed more romance science has taken the romance out of war, determined the winding and losing sides but other, and the outcome of that single contest naten while two champions rode at each or Sumes would passe in their fighting to great number of single combats, and often at the saddle bow Battles were really a armor, wearing a lady a glove or bit of ribbon le sime way on horseback in their suits of . was considered romantic Men rode gal-N the olden days of romance, war uself

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SOME TREASURES OF THE ORIENT

Travelers in Bolds, India, paraing the time of day with December makeng on their digh boltony. This remunit



were once known to them only in taily tales and American uniforms into lands which after another, carrying soldiers in British structurely through one Oriental country torest fires around the world swiring de Now two great wars have spread libe

SETTED OF THE VISIT and the records that the Chinese have preriscs the strange journey of Marco Polo and tisitots centuries ago #e are even able to the bills of China of a bite men a ho came as our west coast we find legends far back in nest the 'Far East, by traveling nest from Even today, when we in our new land narejets got on their journeys

to guess just how ist it was that ancient trom netton in those old records and hard Far East, we find it hard to separate fact the Near East and the Middle East and the take us from the old European centers into ships and planes and the Oriental Express legend of the Orient, and even today, when Out of such fanciful ctories grew the bittle more

tales of their travels, they remembered a dangers, and each tune they repeated the travelers who had seen wonders and taced nere admired by all their neighbors as great they said they themselves had seen bo they to it, and imagined a number of things that told what they had heard and added a li the Jour So the travelers went home again and stories to visitors about what her just befir) gailes to colors elevie sted erogelity and they were told fantastic jarns, because of Greece and asked about what lay beyond haps they got as far as Cyprus or the ester about the Unent than bid et er seen it Per-More travelers in the early days told

tor that is what the word means Orient, the lands out of which the sun rises, Ocean These made up the Far East, or the china and the spicy seles of the Indian country of Tibet, and the labulous cuties of them iay todia, and the my sterious hermit Arabia nere the Middle East, and beyond falestine and the borders of Egypt and came to know them sooner Turkey and these he called the Mear East, and of course came to Greece and the Balkan lands, and The daring traveler, journeying eastward, just before he reached the mosques and the minaters and the guarded harems of Turkey,

TO REACH THE TAR EAST CHEYS DYRING MYS MEEDED

DESTRATES A Heliespont and the tarthest isles of the Aledi

back strange tales. India, too, lay to the ist 't hose who did, like Alarca Polo, brought eastward and few men had dared travel so thought of as "Far Cathay" It lay to the zation was centered in Europe, China was cieco, but in the days when all modern civils was younger China is west of San Fran which European civilization knew when it prior tent to age and brothed that world capital letter, has come to mean those coun in the same way the East, spelled with a redskin bit the dust '

up,", Ride 'em cowboy," and "Another sheech was full of such terms as , Stick 'em and cattle tustlers and 'bad men," whose tronuer, peopled by conboys and Indians trust but of the county which was once a which happens to be nest of us, but we mean capital letter //e do not mean any place meant by the West, it we spell it with a Canada or the United States know what is and brench and Kuss and Poles sprang to quect them yew cities beabled by British of the " est, with engineers and contractors drilled and trained laborers had to come out to be laid and modern ou wells had to be bed sites freesure of to to suspent tests sai nh oh the basesons and green of manufact is period but the chief reason it was stirred tion the Medicertanean to Kussia which iay inscream supplies had to be carried across it Persia was drawn into the war because

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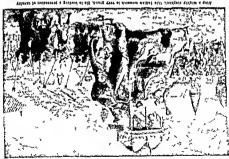
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Dreams are mysterious things you know it they seem to you fragile and easily lost

the old people to the grandchildren Ottent so the tales are passed shong from felling is because there are fener books in the live happily fores er after Perhaps this story comes to tree them and marty them and nurry a praudsome prince or even a poor porcer Beauty suffer under some mag tran s spell beautiful ladies who like the Sleeping powerful un unprisoned in bottles and tolk tell tary tales to one another about dreaming and more story telling Grown nutt as fast as ne do They do more day The men and women of the Ortent do not seem to cling to the ways of childhood longer more loudly and publicly Thems is a simpler sing more readily and in some countries neep in Eayer colors than we and they dance and The men and women of the Orient dress

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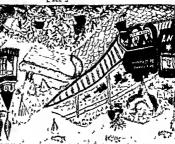
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7 Peace—Cordell Hull, Washington, 1945
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1944 Chemistry—Prof Otto Hahn, of Berlin now in the United States. 1944 Feace—International Commutee of the Red Cross Centers adviraceland

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and terrible possibilities for destruction and (3) Will atomic energy, with its awesome tear freedom of speech and religions Eastantee political freedom freedom from

freedom from a ant-as we have worked to work as hard to assure economic freedombaoquence hears, ju orper nords will me browide for themselves beyond their own and comfort to educate their children to wage which will allow them to live in security granted decent working conditions and a (s) Will workers all over the world be will stand together to preserve the freedoms? that for all time to come men of all figures made to carry over into the peace and assure Allies demonstrated in World II at 11 be (1) Can the unton and strength which the

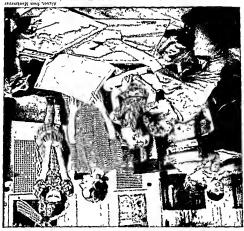
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dillerent from theirs Vidgile mugifer eid to tolog imprellin a gew tor no better reason than because his skin even nave seen a boy beaten by other boys and menacing words race riot! You nay their employers You have heard the ugly suo usuagement-between workers and going on in the United States between labor seft for ruow about the bitter disbutes

s türtelilistelikistelili illetiti kaladırının illetilik ille illerik illerik illerik illerik illerik illerik i By Norman Corwan, author of On a Note of Trumph

the World Today Questions before

To understand world problems, keep your geography up-to-date Those fitth graders use plastic maga.



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the current as a convoluent. We make your possible of the current as a convoluent. We make the current as a convoluent when you also like a current possible of soft high first great probability of soft high first growth and convoluent as better would fory our will her entropies on any other may be a man gets offler as are to the convoluent and our more than a man gets offler as well of the convoluent and the con

group which is in the majority? Or will the members of minority groups—for malance, in some countries, the Yegro and the Jew be judged as all men should be judged, on when we are all the course of the course of the course of the cult from the present and the cult from the present and the cult from the present and the cult from the cult

seconds to come back. By refining the opera are used in going toward the chil and two return to him in four seconds two seconds mont the ci if when he shouts the sound will distance to the chill if a person is a 200 feet accurately it is possible to determine the can see that by measuring the time interest MOVES At 20001 I 100 leet a second 50 Jour the chil and return 1/c know that sound the time necessary for the sound to travel to and the moment the echo hits your ear is shout return to you after a short period of sonuq tenecting med um you will hear the on avont in the d rection of a ci ii or other that of sound echoes or wase reflection it tue brinc bie or radar is very similar to

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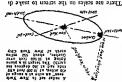
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as row on post as the next free years redar will be in In the next free years redar will be the stackfood on each; all the ships of the world a merchant marine. The electronic missele will blackness it will warm of retberga, other cessels, redg, sunken bulks or shortlines it will post out of knineti markers, lighthouses, busy and docks and docks and docks and docks.

uter, mas responsible for destroying much of the effectiveness of the Centain relating the air mg systems RCVI operates by filling the air with false echoes to deceive "listening" radat deferators. D Day in Normandy saw reds play a fight in Normandy sever fourth the ers and ginders were guided to their destinafore by small seden even fourther of radar, fixed self-sever of Norman Multi Messficial services of Norman Multi Messficial several play of Norman Multi Messphanes of Norman Multi Messker and Multi Multi Messphanes of Norman Multi Mult

tion 53s enemy planes nere shot down help of radar In one twenty tour hour peman bombers night after night, with the ANT FORCE WERE ADIE to turn back the Lertively small band of brave thy ers in the Key al ain, during the autumn of 1940, a compara-War II are countless in the Battle of Brit-The dramatic victories of radar in World blast targets at raght or through thick clouds or somety summed instructions and more party assists pilots to land safely in bad weather permits identification of triendly sucrait and enemies in the sky, on the land and sea, byspes perbs queet gaugue perbs search for teries Fortable equipment carried in airlights, and aircraft guns and big gun bat shippoard control equipment such as searchtheir courses Radar sets on both land and earth s surface, helping natigators to plot span approximately one quarter of the long range navigation (LORAN) stations the gray of fog Complicated networks of quect uggret planes in the place of night or range of sight or hearing intricate systems secting planes long before they come into unge ground stations are capable of de There are many applications of radar

the observer rection and distance determination easy for There are scales on the screen to make di-



Thus means, of course, that the ecoholmous internal and other control and other cont

Children are shown unbilum deposits at the Eddordon ming, Coal Race Labe, Conda



that phosphorese in the dark after being in ordinary hight also give off \(\sigma \text{rays} \) ence Students tried to see if other materials I postip necesses ne cult this effect in set of the point where the 1 rate fall on it. ray tube because the glass begins to since that a ray's came from the glass of the tine solution to the riddle Come the ught all kinds of experiments in the htpe of tind and groped for an explanation They made where were curious about the strange rath ecteuring world by the ears Scientists every unknown Routgen s discovery had taken the English structs for something in stemons of them better as a rays a many lan after the man who found them but we know They were called at first Runtgen 137"

class to the younger students followangs them in 1893. Processor II theim kontad Kont trous and the 1892 Processor II theim kontad Kont trous and the 1892 Processor II their kontages and the 1892 Processor II their students and the 1892 Processor II their students and the 1892 Processor II their students and their students are students and their students and their students are students are students and their students are students and their students are students and their students are students are students and their students are students are students are students and their students are students

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THE STORY OF SELF SYLVSHING ATOMS

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-те полуже пт бие потогу / эне влакан в ton has a possible charge and the electron or the opposite tand so we say that the procarries the same amount of electricity, but I pe second of these particles, the electron,

tive electricity, the smallest amount that The Inoton carries a small charge of post-1000'000'000'000'000 000 000 000 WITH LINGUES BAG SCION STICK IT

you would need to write down a number per of protons that make up half an ounce, westing so juige that if you counted the num Yet every atom is made up of still smaller particles. The most important particles are protons, electrons and neutrons. The proton ouly one hundred millionth of an inch in size trafe greeze that the largest of them may be No one has ever seen an atom but seten as diseny review our understanding of atoms Before we can proceed with the story, let Buizeme

The knowledge gamed in fifty years has been lowed each other in very quick succession NOTE OR ESCHOOLING That discoveries 101 was very tast, so many scientists began to After the discovery of radium, progress

MOST IMPORTANT PARTICLES IN THE ATOM PROTOKS ELECTRONS AND REDINORS ARE THE

e (en tuo gatoase at antaera pure is several million times atronger than tive than uranium Radium when it is very Both of these substances are much more ac and The second one was called radium tonsum in honor of her native country, Po-The first of these Marie Curie named po from the mass two new radioactive elements and agam, they were finally able to set free and puriting it, and then puritying it again breakingly difficult job of examining the ore, taken out of the ore After a long heart terial left over after the uranium had been of Austria, a whole ton of the waste ma incry enough to get, from the government pounds of rock to investigate it They nere so they knew they would need hundreds of WAS IN UNE OFF IN VETY VETY SMALL ANDURES pretty sure that what they were looking for the puchblende very carefully They were tive than uranium 50 they wanted to study contain other elements even more radioac DIRCH THEY SUSPECTED THAT THE OTE THERE ruonu se bircupicune pecense it 10072 20 innes at Joachinsthal in Bohema, and was combounds This came from the uranium much more active than other uranium timus and tound one piece of rock to be very large number of ores and compounds of ura-

Sklodowska Curie These two examined a Freuch phy swist, and his Polish wife, Marie querel in Paris They nere Pierre Curie, a I'mo carnest students worked with Bec

MICHPIPADE BA MYNIE VRD BIERSE CORIE REDICK AND POLONIUM ARE DISCOVERED IN

third letter in the Greek alphabet nece stubyly called gamma rays, after the more penetrating than the beta 1255 These litte sent to baid radtone litte tuo base est Later, it was found that radioactive bod-

to pass through both silver and paper tel a photographic plate, for there they had pecu the beta rays that blackened Beeque als Rutherlord bgured that it must have through sheets of fron and some other met speets of baber, but they do tonaze the air easily, that is, they will not pass through Greek alphabet The alpha rays are stopped beta rays, after the first two letters of the umu tays He called them alpha rays and that there were two kinds among the ura ther studies on these rays and soon found Ernest Kutherford, in England, made fur-

ay it became 'tonized 't encernenty pass muongn, or, as the scientists changed to a conductor by these tays, it let is normally a good insulator, was almost at charge This must mean that the air, which electrified body, it would slowly lose its rays were passed through the air near an through which they passed, in much the same way that X rays do When the new soon that they did something to the air after being in light. As these new rays are given off in the dark, Becquerel knew that they were not Light As the also found out very those materials that did not phosphoresce maternals sent out these same rays, even the metal used, and found that all uranum rater he tried other uranium salts and even plack paper, but also through the silver ind that had passed not only through the mine salt must have sent rais of some had been "exposed" In other nords, the ura blate and found black spots on it The plate this way for several hours he developed the on top of a photographic plate, with a thin sheet of silver in between Affer leaving it strapped it tightly in black paper and put it some of this greenish looking salt then he violet light ritst he let the fight shine on phosphoresce brilliantly after being m ultra of the rare metal uranium. This he knew did did not have much luck until he tried a salt was Professor Henri Becqueret, or Paris He One of the men who tried along these lines

tron that dashes out and a proton that stays that a neutron solently splits into an elecno electrons in a nucleus What happens is spooting out of the nucleus, though there are electrons Yes, they are electrons that come

The gamma rays are not particles, but решиэд

to this tater on in the chapter all these outer layers It e shall come back it, for the nucleus is too well protected by from the nucleus, where we can not get at spells of the stoms-hut ratioactivity comes sie icany dealing with the outside layers, or why this is so, of course in chemistry we sipps, beta and gamma rays We know non changes the way in which they send out their ine substances is that nothing we can do the remarkable tinng about these radioac ompressing the gas or thinning it our but me or at they were dealing with gases, bi action by heating and slow it down by cool with each other they could speed up this rethat whenever chemical elements "reacted in the past chemists had always found egel legi

wolg assum ng from the actinium which makes the utes and then comes back. This proves that plom at it, the glow goes away for a tew min atonud where the actinium lies But if we ubule, thus acreen will begin to glow all cent material such as sinc sulphide Affer a shich we have sneared a little phosphores dark room he then lay it on a screen on it in a thin sheet of paper and take it to a wrap some substance that has actinium in example, we can make this experiment ne the the tadioactive element actinion, for ments Usually this gas is tiselt radioactive gas ruar is broduced by some radioactive citemanation" which we use to describe the a describe what happens. One of these is se have to use many new words and terms As we learn more about radioacutvity

ENVIRONMENT SECONDS SYDIOYCILAE LIZELL MINE MEICH COMES 1220 CORINCE MILE TH

the the only rays known to be sent our STATE TRANSPORTERS see it, and so the ware seems to have be-As the time is so extremely then we can not this thin him stays radioactive for a while metal wire, for example, it leaves a tery, and is that when the emanation gas touches a as it it were radioactive itself What happens that gets close to such an emanation benates Often, too, ne find that almost any object

> A NEUTRON SEEMS TO BE A PROTON AND AND AN only about 1/1850 as much as the proton same amount of charge, the election weights small particles is that while they have the another 14 hat is strange among these very repet one another, and electrons repet one tons ity to get anay from each other-they tract each other very strongly but two pro-

ETECINON TOCKED CLOSELY TOGETHER

the atticle on Atoms, page 43, tells how tons and free electrons peroug to any stoms, we call them tree pro-These, of course, are particles that do not the path of a single proton or electron ynd we have many photographs that show ways of thaking visible their effect on gases ticles, we have heen able to deside several Though there is no way of seeing such par be stound a trillionth of an inch in size custige ocientists guess that a preten may together, canceling one anothers electric be a proton and an electron locked close "c call it a neutron A neutron seems to no electric charge that is why of course, Autually the same as the proton, but it has The third particle, the neutron, weight

n the shell nearest to the nucleus, 8 in the patients The uranium atom has a electrons a) ers or chells, and the shells inflow certain speed The electrons seem to be arranged in electrons circle round the nucleus at high stom He call the lump the nucleus The tignity together in a lump in the center of the the protons and neutrons are packed electric charges, which add up to no charge se-su cours number of positive and negative edner ununget of brotons and electrons that and 92 electrons Alna s an atom has an mention, which has 92 protons, 140 neutrons which has one proton and one electron, to make the dillerent elements, from by drogeo, protons, electrons and neutrons combine to

sugarcite means aipha, beta and gamma tass That is what ont the rays we have been speaking of-the (all apart. As a nucleus falls apart it sends the uranum atoms sooner or later begin to os pue "genous suons and su pre recongue and so is heavy, too heavy The forces that hold nu-An atom with 138 protons and electrons

next shell, 18 in the next, then 32, 18, 12

The beta rays are also particles. They are They carry a double electine 23171750 gether it is more exact to call them alpha two protons and two neutrons locked to-The alpha rays are chunks from the atom,

near that may Let us take antiber case t at 200 if the nothing left it does it to freibinud and that aller one bluow eint rucin pre cont ont su sibur brittete con take, say, one day before one per cent of his it smole to bail relibertied a gnome now say (from their experiments) that turmon rimes a billion atoms and physicists eseu m a purpoint mere are more man a could not tell what would happen to it. But scine stome it we true inst one stom ac a title money the same is true for radio that on the average the company will make den sing of summond ains air faut naut anout 10 50 the companies calculate their they will on the average, tive until they are oute beoble have teached the age of 30 say tables the insurance companies know that any one person, but from their records and one ever ypows what is going to happen to the company will make a lot of money of DIO STES CO 1370 Et SA LITUR ES 716 DO 5 ESTE OIG the company will lose a great deal of money one the day atter he takes out his insurance his children when he dies vow it he should in return promises to pay say 510 000 to esen hear to the company and the company, sursuce he pays a certain amount of money betson who to 30 years old takes out life in entsuce comband poors at people 1/ hen a radioactive atoms in the same way as an in plaus what that means we have to look at As oT bill another term is hall life

etectron rolls meaning libit is has a quantitive described rolls meaning libit gained by one electron are been it leaves been one electrons have a consider a beginn the ending rolls of the present the constant and a page of the page rather a page of the page

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THE NEW TERMS WE ARE BEGINNING TO USE

tenth of an meh thick and even through a spect of atumum a sie much mote beneugnuß as ne can it hght They can also go much farther They infer her recond that is striver the speed of ruck react much taster than alpha particles es The beta rays are very much inguier and unice per second, can travel nearly 41/2 inch the instead with speeds of about 15 000 ries aet stobbed after one inch of au but they get stopped-the slowest alpha parts the) go the tarther they can travel before men or so of air will stop them. The faster tery lat A thus sheet of paper or even an teth pilly sheed and they usually do not get mese rein trun barticies this is not readly a to no our that the alpha rays travel at speeds of to ooo miles per second or more Among tievel in a curve by this means we have longer move straight but begin to turn and bjøres charged with high voltage they no tween two powerful magnets or between two charged so when we make them pass be and beta particles They are electrically the can measure the speeds of the alpha

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in the Middle Ages was to make gold out of of clements while they really wanted to do The technical name for it is 'transmulation IDE Of oue enemical element into another iges, it was known as sledemy, the chang clement This is the dream of the Middle in other words it becomes a NEW chemical and changes its chemical properties as well su sibre barricie it 1086s in Browne weignt that when a fadioactive element shoots off SOME SET STREET STREET OF TROUBLES SET WANTED cycuncal properties and make it behave from its outer shell This will change its 11 does tuis ph Ectitus tid of two electrons charges, that is, it must lose two electrons the nucleus, so it must also lose two negative brotons that is, the positive charges less in 238 Delote now weighs only 234 It has two alpha particle, is that the gross that weighed nium nucleus, for example shoots on an the expression wast nappens when the ura yes, and the atom must balance itself after cusuge the electrical natance of the atomic z brotons and z neutrons, thoesat that an alpha particle-that is, a combination of the nat nappens when the nucleus shoots out ontaide as it has protons inside the nucleus

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same number of electrons moving on the

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life, of that I and of a store and the first process of the first proces

of that metal. An asotope is almost the same trically at all However, it has changed in weight down to 234, and what we have is a new form of uranium, known as an 'solope of the major the same of the major the same charge cach, the stom has not changed circ. and the sets particles with one negative one sibns barrere with two positive charges, urannum il But now, after first baving 1050 more than one minute and changing into much taster, living a half life of only a little utanium % does the same thing again, but weeks, and changing into uranium X. Now off a beta particle, living a half life of three as thornm This breaks up again by shooting weight 234, but chemically nearly the same If then becomes uranium-7, of atomic fatt fale of uranium is several bullion) eusoff an alpha particle, rather slowly, for the 140 neutrons and 93 electrons 1-11st it snows of total weight 238, contaming 92 protons, It begins with ordinary uranium, an aroun

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cheaper metals We still can not make gold out of cheaper metals. That is, we might possibly change a few atoms of one element mito gold, but to make a pound of gold from cheaper dements by transmutation would cheaper dements by transmutation would

bomiol sea 910 ides how long ago that particular piece of answers agree, then we have a pretty good have made the thornum lead, and if these two um lead, and how long for the thornum to men and becaused a said of ero suff as much now long it nould have taken for the ura the intermediate products we can calculate spart Next, it we know the half life of all taily we can tell these two kinds of lead prantum fead and it we examine it very crite Some but the thorner of the same of the same ne always find a small amount of lead in it and which contains a great deal of uranium ite, which comes from the island of Ceylon memons en dans suo na adei su in mod. Soc read weight 207, and thorium lead weighs Uranium radium lead weighs 206 actinium teally they do not have the same ueight read and behave exactly the same way chem -want all these end products are totopes of and this is the interesting and important part schach shesping this lead is dead Butwith lead, and again they stop there-radio

A VERY GOOD ESTINATE ON THE AGE OF THE EARTH IS ABOUT TWO BILLION YEARS

Oge sues (that the earth was born about two bullion shorter than this, and we may therefore say cartit was a gas or a liquid was very much make a tery good guess that the time the now is about 1,650,000,000 years We can the earth the dest answer we have up tells us how old the rocks are in the crust of Ine answer that we were getting above then with the utanium from which it was made ters of bed best munueru sal-ston yne ficies could not get away from each other once it became a solid piece of rock the par ererything could more around and mix but So long as the earth nas still a gas or a inquid lata and still later this lava froze into rocks they cooled off and became liquid, much like existed in the form of gases, then gradually einersem ein tent bon og enm abres och gunn was born but ne do know that in the begin the do not yet know exactly how the earth

Sumeer reducts at the beat howers of all in donedric elements for us table a higher more about 1—where it is bound, what it looks the and so on Hadeum is sharps extracted the mon unsument ones and the first redum even obtained by the Unites in Paris, came from the contraction of the properties of the formation even market and barrier and long and the properties of the properties of the formation of the properties of the properties of the formation of the properties of the properties of the formation of the properties of the properties of the formation of the properties of the properties of the formation of the properties of the properties of the formation of the properties of the properties of the formation of the properties of the properties of the formation of the properties of the propertie

> DEST 10 an atomic weight 210, and again an motope ticies and changes into radium D, now t the millionth of a second it sends out alpha par of them all, for after a brief life of only one radium C. This is the champion performer with a half life of twenty manutes becomes it changes into radium C, which repeats, and atter a halt lite of a little under half an hour much so, by shooting off beta particles and But even this atom is still radioactive very same as that of lead it is an isotope of lead art The chemical behavior is somewhat the particles and the atomic weight is down to dum B By this time ne bat e lost six alpha ts half gone in three minutes becoming rawhich again shoots off an alpha particle and alpha particle, it changes into radium A days, after which, by sending out another radon is very active, its half life is only four 222, and chemically similar to neon But nation, a very heavy gas of atomic weight sers it changes into radon, or radium ema amount of radium is half used up in 1 600 and sends out an alpha particle Any gnen magnesium Radium continues the actualy a weight of 226, Chemically it is samilar to ground Ladioactive element of all it has particle and changes into radium, the most 83,000 years, tontum sends out another alpha meanum X, and thornum With a half life of neight 230, and chemically again similar to gibus barreres and necoming tonum, of with a half life of 300 000 Jears, giving off aity This again breaks down tery slowly different atomic weight and a different den

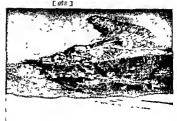
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really only one park in 20 000,000 units carth This sounds like a good deal but it is milion tines of radium altogether in the mate that there can not be more than 300 the bot getting any holler we can also esti comes from radium and because the carta a targe part of the beat muside the carth mentes, brom this we have calculated that sater to the bothing point in about forty hive edium would heat up its own weight of pursicular pare found that a small piece of layers And so the radium heats up and the out by the interior get stopped by the outer cacu as juice as a p upcad the particles sent rafs into the air but in a larger amount s time exect of radium sends all its alpha

was and its offer sport at most able case, the standard of the sport at many and a standard of the sport at many and a standard a standard as a standard as

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than one ounce per) ear

States where medical we alone was more if ber ? ear most of it going to the Lmited whole world produced about four ounces of 250 000 bet gram Just before the war the Congo and in Canada the pune dropped to out aller the discovery of the ores in the \$100 000 (Bearly \$3 000 000 per eurce) teno musher to mery and tent It musher ntanum penerally contain only one ounce of on can guess from the fact that foo tons of quincrit a lob it is to get the radium pure tailes from the Arctic Circle How long and ridorado mine there lies only twents six found near Great Bear Lake in Canada The deposits of uranium radium ore base been cicutist who noticed with Rutherford Large soddite after I rederick Soddy an English Belgian Congo These Mican orea are called notice which is rather proor in uranium and

pheasant But if he fired a machine gun, wonld not have much chance of bitting the and then fited one shot from a 22 title, he on a putch black night, into a forest, buning, for a pheasant. If he bindfolded himself, not take aun It is as if a man were to go out sell tiul, but no one can see it, so ue can than done, for not only is the nucleus ver), netes at the nucleus? You that is easier said betteres' so and not tak to spoot subpy bet fution A radioactive atom shoots of applies HOM CER WE GO THES KUTHERTOLD SOW THE SOwe pure to Set through to the nucleus itself it we want to do something to radiciately! suntile includent of So the problem was not be bothered by the storm when you are ney down, but in a well built house you will on the tool, or perhaps even blow the chim sud apple windowpanes, tear some shingles and bowling outside, it will rattle shutters the same with a bouse if there is a strong side the atom, and is well protected by this being to and in the nucleus which is way in faser faufy easily But radioactivity hapfuest jouces on it "e can get at that outer telly, by beating or cooling, or puting electhe outermost layer of electrons and matu epennest pepsition of stoms debends about ith is nuiding the now understand why the means he know and in this way radioactiv sibus barrecies can not be changed by any ity the rate at which radium is shooting off to tall apart again Not so with radioactiv near the carbon dioxide still more, it begins oxygen to lorn carbon dioride but it we gue to prim' that is to say, it unites with the coal to the right temperature and it be temberature and nothing happens But heat and oxygen-teace them together at room cold by electricity or magnetism. Take coal things could always be undurenced by heat or scoms do all kinds of things but these ments with all kinds of atoms and have made Scientists have made a great many experi

CAN NOT BE SPEEDED UP BY USING HEAT RMUKE OTHER PROCESSES RADIOACTIVITY

earted eathbar

it so mace as go not the tisk of getting mer, and it we can make sure that by using it the price of radium comes down still fur mercase in the use of these paints, especially the next few sears we nigh see a tremendous things which we have to find in the dark. In electric light fixture, on doorknobs and other on the little tips of the pull-chain for an om cere sud I on pare propapiy seen it used to preodused an no lead book a m sas year

on the metrument panel of amplance Ne commons bains find a great deal of use property

E Satisb sidist spent ad of bed ted slody too, in painting signs on air raid shelters and treated with luminous paints. It was used and sight on field guns and tilles were needed during the war instruments on suite sway it is entirely included. This made it the giore is really so teeble that a tew pards ont watch and clock, when you are near, that while you can easily read the time on et adait eidt to santnerbe testa? wotg terb it of nicht, you will see the bgures on the take the watch into a dark closet, or look at That 15-it looks greenish in day helt But painted with some greenish looking stuff numpers on the dial and the hands had been even watches and alarm clocks in which the way for many seats fou have undoubledly nen e'es one 'isin ie sen it ienn to min and brighter, then it drops ou to about onebaint has been mixed this glow gets brighter ten ngint ror ine urst innee weeks atter ine see it begins to glow with a sort of a green tays sent out by radium which we can not pre r ettange property When it is hit by the printe-1 part in to 000 or so Zinc sulphide smount of radium as much with sunc sul nous paints to make these a tery tiny ilar elements found a practical use is in lum mis radio bus mulere radium and other sim

AOON MYSCH DIVE SHIRE IN SHE DYES PANINOAS SYINIS MHICH ASE BYDION NYES

die down after four days-its half life-it begins to made it reaches its greatest activity and rour hours after the preparation is tirel is turcified fur the rick base of the pody in a very thin glass tube, and this, peedle developed whereby some of this gas is sealed effective as radium itself. A method has been se sount to spresuodi et-eeg e et north nort was found that radon-the radium emana councinnes even kuited the patient. Then it radiating and burned bealthy ussue and the diseased tissue, but after that it went on given it nouth often cure a cancer by kining care At first, if a radium preparation were one sud must be handled with the utinost quoscine substances are extremely danger diseases Bul very early it was found that ra could be used to cure cancer and certain slim to find out whether radioactive materials the cells and the tissues in plants and am stances can , burn and even hill and destroy is that the rals sent out by radioactive sub

because of the color and the c

REDICAL DOCTORS IN TREATING DISEASE

last for dava and even years a tew minutes or hours but sometimes they nb tsther quickly their balt life being only seine arincially in most cases they break eren chemical element can be made radiokinds of atoms and we know now that nearly then, experiments have been made with all made a new radioactive substance since considerable time, in other words, they had echt ou seuquit ont tra postreous tor some pomparque sibps barricles the slummin to be positions, but—and this was the great, new thing—after they sout off the stream of or particles, was sent out which they found with alpha particles, a stream of new rays, when they hombarded ordinary aluminum LIGERT and Marie Curie, found in 1934 that licine Curie the daughter of the famous great discovery Frederic Johot and his wife, A tew vests jater brought still another

gret the about particle google also roughd for three dominations 1. They built several madrates, gave in construction of the controlled for the construction of the controlled for th If first it was difficult for physicists to corery of the neutron peen unknown if it had not been for the dis whole story we told you belove would have perfect pow an arour is but rogerner and the Puow about the neutron we understand much the Youet Prize in physics Yow that we TROW, and for this discovery he was given no charge at all, and Chadwick in England, who discovered thus, called it the AEU-But now it was found that this particle had 13, and shooting off a particle of weight 1 split, becoming ordinary carbon of weight ately the new atom, with a neight of 13, an alpha particle of weight 4, but munedi da yoo 6 to tuling a man will to 6 to dead ed with albus particles the same think hapmagnesium, but still lighter-mas bombard When the yery light metal beryllium-like

tery important discovery because in detail, because they led to a bened that us look at some more of those exden land see of aver and in emote to sonth a great many sciencists began bombarding au snother This was in 1919, and unmediately anceceded in transmitting one element in papaaaans one chemical element into another He had and h) drogen out of them He had changed nittogen atom together and made ovygen the first time, man had put a helium and a os pary (1) undoup (u pur (11) und (xo curit is not staple-it prove no turo peach happened, for this kind of fluorine appear rectors, of weight is then something else comporatily become an atom of morningsiphs particle with weight 4 and then would cleus, weighing 14, actually could catch an And in this way he found that a navogen nu and then bomograded his atom with those queed a constant stream of alpha particles Kuthertord did he built a machine that pro ponts, he might score a hit That is just what turning it in all directions and for several

Meat given nd by na miomic bomb enpleases three



tron it falls about and produces 4 more near -neu i ultw mole municin i lid aw asoddud But those spare parts are very important neutrons-spare parts, we might calt them remaining 4 come out in the form of single not all, 127 and 104 add up to only 231, the a milk heavier than the other But that is deal at different times, though one is always about this and the pieces may differ a good weight tot There is no hard and tast rule tent and bins yet sudds addiew sail mote 532' spiz abriz nestly in two, producing one tron (1) at a transum atom of the weight known, transum, that is if we shoot a neu ith the same trick on the heaviest atom atoms are tartly light atoms, but when we helium atoms (4 each) Now all of these ton (1) at a boron atom (11) we get taree behum atoms (4) Or when we shoot a pro at a lethium atom (7), for then we get two splits evenly, as when we shoot a proton (1) ing usually of weight 1 But sometimes it two rety unequal parts, the smaller one be first the two add up and then separate into peneron (1) That is what usually happens perstraint (5) and got carbon (12) and a t Chadwick shot an alpha particle (4) at got oxygen, venght 17, and a proton weight weight 4 at a mitrogen atom, weight 14, and tord originally shot an alpha particle of them mee different kinds of atoms Kutherbarricles or with neutrons we can change nate when we bembard atoms with alpha of radioactivity We have mentioned above nork done on it belongs in our present tale to tell-you will find elsewhere, but the early rather, as much of it as we are now allowed stomic bomb The whole story of that-or ety that has come out of radioactivity is the the most recent and the greatest discov

ESPACIEUS ENOMA VE CHVIN NEVCLION LUR VLONIC PONS MOSES BA LINE

Parties Applicable to the property of the prop

brants' angars and starches are made out of

In the study of plants, too, these tracer materials are very useful Ne have known for a long time that in the green leaves of

and not seemed about metal of a oldinary assistance of metal and a seemed about the seemed and a seemed about the seemed as a seemed about the seemed as a most of metal and garden and gar

THE BLOOD, AND THE WAY PLANTS LIVE THE BLOOD, AND THE WAY PLANTS LIVE

ils is misd on they will leave the body afterward and do elements temporarily made radioactive then lines peing stound it we can use the lighter and do a great deal of harm afterward by are very heavy They never leave the body, and all other normally radioactive elements Bire radium salts to a person because radium the rest of the body afternard // e could not sport half life, it does not cause any harm to bill the fumor, but because it has such a against a tumor, its radioactivity helps to we use such radio prosphorus as treatment sud other bones in our bodies Also, when nse uestly ten times as much phosphorus as through it we have found that our front teeth phorus is one of the tags he use most, and chemistry when we use them Radio phos serve as a label or a tag on the ordinary ele These temporary radioactive elements can

stream carry it to our finger tips but it in the plood stream, and the plood pow tast our stomach can digest the sodium esting things about our bodies, in this case and we are finding out a lot of very inter without the sughtest danger to themselves, rura may numana can serve as gumea pigs 19As and spooring barrieres into space in casting" its presence there, by sending out tived in his finger tips and is liferally broad two minutes the radiosotive sodium has at of radioactive sodium \/e find that after numoure Aun e surendo neun n ut nes unum now we can have him drink a glass of water full two gained to ten on ad bluon atach tore that sodium got into his inger tips, wanted to know how long it would take be which contains the element sodium and then distance If we fed a man ordinary sait buosbuotus not only snows its presence in Here on the central and receives the same of the central and t

tor, and this is exactly what we find region around the Poles than near the Equa more cosmic rays hitting the earth in the this we can figure out that there should be magnet-and the earth is a magnet From carry electric charges they curve around a sea level Because cosmic ray primaries many rays thelve miles up as there are at gone, too there are about too tunes as gone again, and a good many princattes are to sea level the secondaries are nearly all stoms yard so py the time the 185 s get down the prunaries, get stopped by hitting other than primaries As they all move loner down, the earth there are many more secondaries and secondaries, and about theive miles above pens a gamma ray is produced, these we can byere and every time such a collision hapthey hit the atoms of the gases in our atmos them 4s they come down through the au ust cosmic tays, or primaries, as ue call tweely charged particles. These are the origiwe now believe that they are mostly puseat much like a rays or gamma rays, but At first we thought they were read "rays

VER SEVIER SVELICIES VED NOT BATS SCIENTISTS NOW THINK THAT COSMIC BATS

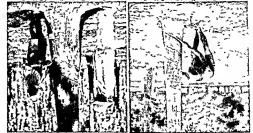
mentary, our thorn to the forlown of a degree that many feet of the control of th

Here our story about reachestrary and a bare our story about reachestrary and a but we feel that we should rell you should rely with the connect Rays. When the the the with the connect Rays of the the the the we know that it we can stop alpha, hear those we know that we can stop alpha, hear may we know that we can stop alpha, hear may we know that we can stop alpha, hear and we know that we can stop alpha, hear and we know that we can stop alpha, hear and we know that we can stop alpha, hear and we know that we can stop alpha, hear and we know that we can stop alpha, hear and we know that we can stop alpha, the story we know that we can stop alpha, the story we know that we can story that the story we have the story that we were the story when the story that we want to story the story that the story that

YEE STRONGER PAR ABOVE THE EARTH THE MYSTERY OF THE COSMIC RAYS WHICH

itzation, but to make it giorious Just sure that it is not used to ruin our civil now growing up, who will all have to belp the case of atomic energy, it is you, who are to see that we use science only for good in good or to do evil, and it is up to all of us Alany scientific discoveries can be used to do all of us, as citizens and human bungs of du st fedt ino band sven sweet bat a c can never stop halfway But how to use nuiverse % e search for the truth only, and murch as we can about what goes on in the more and more things in nature to learn as entiate perions that it is our task to had out stopped before they got that far But we ser-DOME, and that scientists should have of the scientists to have invented the atomic Now some people think it is yety wicked duake violence

only one little ' push ' to blow up with eartheven compare it to a voicano, since it needs 20 macy energy is stored up in that we cieus of such a heavy atom a power house soo tons of TNT, one of our most powerful explosives No wonder people call the nuas bed as as drawd a as musinary to bayon can casuly see then why people say that one to bring to boil too tons of cold water You more than to 500 500 kilowatt hours, enough Out of one pound of utanium could come trons, but also a terrine amount of power only produces two new atoms, and some neu Now when the uranium atom sphils, it not time that is what we call a chain reaction bullets, and goes faster and laster all the cause it produces its own neutrons, its own brocess has begun it carries on by itself he-What it does meen is that once the splitting we can well afford to have some misses. and so on Ot course, we do not always get such a perfect score, but you can see that esch of which produces still a more neutrons in all, these in turn hit more uranium atoms, and each of those produces 4 neutrons, or 10 trons, these mught hit 4 other uranium atoms,



Tapples for rubber in Sumairs (left) and Liberia (righs) Laten ton the cuts drips into little cups set below Courtery Un ted States Rubber Company

H Π B B E H

RIE C MCDONSI

Latex is an emulsion like milk, that is mant of at equip low the cuts and the later cozes out and toncy true wood Cups are then isstened be ratex is optained by making cuts through the through the wooden truth of the tree The race and different from the sap that hows the latex is a thick milky fluid, quite sepathink of this layer as a sort of unner bark and the wood of the tree truth We may

ened into a spongy mass it is treated to get the Rummy substance When it has thick scige' nestens the rising and thickening of so to to ber cent treating or mixing with amount of rubber in latex varies from about as cream rises to the top of milk. The grand these particles tend to rise to the top muxed with a watery fluid, and it allowed to tpe rink Ermink bairieses of import sie

or caoutenous and is quite different from the original gum, has now become the raw rubber of commerce resement and is combined with sulphin it rid of the water, then it undergoes further

perced of our supply of natural rubber. Then lands in the second It oild If at, we were de East Indies // bile the Japanese beld these inpost has been grown in Alalaya and the in recent , ears a great deal of the natural

day the product of the never tree is known the seaport of I ara in brazil, and even totime most of the tubber was exported from number of different countries, but for a long ILY ANDRAGAS Deven trees are grown in a source and its product is of the highest qual tites The Brazilian bevea tree is the chief comes from the rubber trees of tropical coun all of the rubber of commerce bowever, Aues suged latto bue squays saut saut opramed from a large number of different called india rubber, or caoutchouc, can be Natural fubber, which is also sometimes parquent

the gifts that the New World brought to

discovered America and was actually one of

discovered about the time that Columbus

Rubber is one of the newer materials it was

have been known and used from early times or these materials, such as mon and wood

are fron, cotton wood cost and tubber Some

daily life Among these basic raw materials

that play an important part in our ordinary

comfortable without certain raw materials

De very different and not nearly so

HE world in which we live today would

tound in a spongy layer between the bark The rubber, or caoutchouc, is the gummy part of a thick juice called latex which is as Para rubber and alkalis except very strong ones Alcohol broot and it is not affected by most acids a non-conductor of electricity it is water so il salode bna squiud bna snoisadi / dros de liw is bossaidmoo at it man his axis So will snap back to its normal shape and almost to the breaking point, and when let most valuable qualities it can be stretched Its wonderful clasticity gives it two of its

erings and mats safer soles for spoes, and makes rubber floor cov the road gives us non slip rubber neels and dushiyy is what makes non skid tires sink to on bench marks and soried places. This same ching closely enough to the surface to rub that if you rub it lightly over paper it will per in the first place. All boys and guis know e this quanty that caused it to be called rub satistice on which it is pressed or rubbed It tional quality makes it tend to cling to any and saried qualities For example its fric of modern civilization occause it has so many Rubber has become one of the necessities

Propertog tubber to Sumatto Mere the totes to gove to propert in the new Part of the liquid exposeira.



səsn Auem

they can take the place of natural rul ber in plastics is exactly like natural supper but as synthetic rubber one of these synthetic inppet. These plastics have become known other substances to take the place of natural rain plastics from petroleum coal trains and we restly incit used the manufacture of cer

Wherever electricaty is used rubber is used ales e tiales tol bas yew radout an un tor mentation to direct the electrical current cause it is a non-conductor and can be used enormous amount of rupper, of course Detittle Endgeta The electrical industry uses an electric wiring floor mats and a number of such as windshield wipers insulation for and moer tubes and also for smaller things dustry is the largest user of rubbet for thes wale post pik and jutile The motor car in

nucleum afterig powerd and of worst Cleods agr.



to as in the most astounding number of mese draffites have made rubber useful Accump 152 of

time it Eradually loves elasticity and begins air When it is exposed to the air for a long grees F it is durable it protected from the under mederate nest up to about 100 de (except extreme cold) and it state clasing that it does not lose us clasticity in cold suospet saluable property of rubber is bojispied and is much like tvory or horn

clasticity and can be machined or carred and ou sen it state and all chonic in this state it has no made into a hard, tough substance carled it with sulphin in a success way it can be to any shape and then hardened By treating a plastic state it can be formed or molded queros of beat and does not burn teach in the material it is applied to It is a poor con materials it drues, sucking very lightly to et is applied in liquid form to cloth or other When ruther is used as a cement or give

DET 25 IS Was which evaporate quickly and leave the runcarnon premiupique and other colume induite and regetable oils and in niphtha benzine The castilles tree of Central America and America and Alexico is the source of Ute robber 11 radius and be a darker color and has e reputition in the later that cause it to have less strength

The meaning tree from well-Clears mil-Discuss mil-Discussion Debt of published to also a native of Herail The Series of they reveal they not obtained to the present of the reveal tree; and then they have a part of the reveal of they well trees a tree; and they are more educated to the present of they well that they have a present they well they

RUMBER OF TREES AND PLANTS

The translation from the properties and inmportant, growing with throughout the vell through the properties of the protor of the properties of the properties of the properties of the properties of the protor of the p

of natural fubber are as jollows and latger trees The more important sources The best rubber is obtained from the older is tree from dirt, bark and other impurities sineties of trees are planted, and the rubber per is of highest quality, as only the best the trees grow older This 'plantation rub quality and amount obtained increases as trees can be tapped for the latex and the then takes seven or eight years before the hings set out in rows like vast orchards it tions, as the land must be cleared and seed enue of mouch to establish these planta of natural rubber it has taken immense m 1941, and these formed the chief source cultivation when war started in the Pacific fully cultivated Millions of acres were under large plantations in which the trees are care Our century has seen the development of known as wild tubber

e fager area here some canner, some after species, and a feet region of the canner, continued and the canner, and a feet after a feet a feet after a feet a

There are many hundreds of different quite so good as natural rubber nunct tubes nothing has been found or made rubber overcomes this loss of strength For the addition of about 30 per cent of natural strength, especially tires on heavy trucks automobile tires tend to heat up and lose that some types of 55 htheric rubber used for stands up well under heat it has been found dualities which they lack, 45 we know, it the synthetic rubbers and give them certain that it will mix, or combine, with some of One valuable quality in natural rubber is portant saving in the use of natural rubber recovery of serap (old) rubber makes an unpure rubber for articles such as tires. The Peclaimed rubber is also used to mix with ts used chiefly for goods of inferior strength This is known as reclaimed rubber, and it tubber can be dissolved and used over again out rubber articles are not a total loss, as the the tubber serves as a plastic binder 14 orn articles fillers are used to give more bull, and sary For matance, in floor mats or molded For many purposes pure rubber is not necesstout tabrics are embedded in the rubber where great strength is required, cords or burlap In fire hose, tires and other articles made of wool fibers set in rubber cor ered made with rubber, also carpeting which is There are floors, floor coverings and mais

If you see to notice and out enterphing the block in 15 out see or fourth in one day that has block in 15 out see or fourth in one day that the block in 15 out see or fourth in 15 out the seal block in 15 out of living would be like it all it live mall ben important uses at ill gives you an idea of its important uses at ill gives you an idea of its important uses at ill gives you are idea of its important in 15 out the properties of the problem of the properties of the properties of the post of the properties of the properties of the properties of the properties of the messes to mark paper and sports of the trabber in 10 yes and plays that the properties of t

FOR THOUSANDS OF USES
WE DEPEND ON RUBBER TODAY

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cooling among the state of the second among the second am

The production and preparation of rubber The production and preparation of rubber comes artes very much elegendary upon the kind from the shrubs and times the tubber comes from the shrubs and times the tubber to obtained by Crushing the stems of the modes and maxing with hot water to separate

chem are a roubbott yaddur and not pot in a full orthor in a vorsibility and roubbott yaddur bard and such a sudding a sudding

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The world production of rubber in long tone (2 sto pounds) is green in the follow ing table from a report of the United States Department of Commerce

collination Hatt the cryptostegia has been put under are also being experimented with and in wild rappit bush and the one year castilla acre on poor land The desert milkneed the Edison was able to produce 100 pounds per experiments on a 600 acre farm in Georgia Coverament include a species of golden red pare I cen abousoned by the United States dance sources of natural tubber which inoner her acre than the wild variety does busquees more than twice the amount of of 50 000 acres in California and other southwestern states. The cultivated guayule ment tostered the planting and cultivation eastly eparated The United States Govern about 10 to 20 per cent of resus which are der to extract the rubber This rubber has begut and then crushing by machinery in or is optimized by preading the stems of the to ber cent of the world a rubber 't he rubber pecome the guay sie chrub produced about SECURCION WAS MUCh less than it has since Bend area of Texas, In 1910, when tubber tends across the Rio Grande into the tite northern Mexico and its wild growth ex The Curt of plant is a shind native to

as ¿¿¿Qigas da fon noilabrina ha missul safit.

Estora safit sodari lo source a missul safit.

Lo no radio o i açum simus a montaciparque a cum materia de montaciparque al most o montaciparque al most o most o montaciparque al most o most o montaciparque al most o mos

THE RUSSIAN DANDELLON A SOURCE OF RUBBER IN TEMPERATE CLIMATES

a similar way by the natives toots from which the rubber is extracted in guese // est Africa (Angola) has tuberous from the fibers. The exands plant of Portu in hot water and the rubber then separated phia and other vines The roots are crushed a root tubber from the roots of the landol gonth Sudan in Atrica the natives prepare species of these vines In the Congo and the wild rubber exported has come from other in south smerica in Borneo much of the cheries of tapper producing truck are found vines is the landolphia vine of Mrica Other and laborious The most important of these that tapping and gathering the later is slow Ames sue so angely scattered in the forest killed by careless tapping Then too the is that the vines are liable to be injured or anpper is optimized. The difficulty with these duce a latex from which a good quality of plants in tropical Africa and Asia which pro-Besides trees there are vines and combing

The native Meeting of the medium to the medi

THE SILK RUBBER TREE AND OTHER WILD SOURCES OF LATER

and the area of dominion as India zon and the south of the control and could not be control as a south of the could not be control to back of the could not so the could not so

than the Lara tubl er This tree has also

field pleaten ever of \$ n of \$ 4 to Kin. ar Company Calvaderitat, or proposts, the radder into amount abortic.



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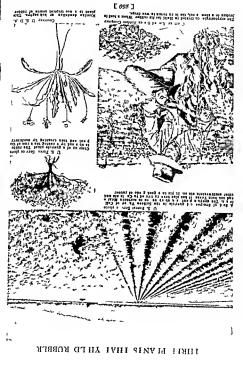
ments fish and the like The rubber prepared in this crude way have no bigh quality for the control of the contr

and partitivity of the assure frangement of the season of

and the state of t

Organishy the authors gathering tubber from the wild trees in the forests used small best may be a feet of the forest used from the wild trees in the forest used from the wood of the truth. This per ofeet may the mood of the truth. This per model to the forest from the wood and sudden the forest forest from the fores

the tubber from the tiert Than, a course the tubber trees the destroys the plant Trom the tubber trees the moduceally, and in that may the tree will produce for many years provided the tapping re done carefully



1 yoo bounds per acte

Some of the tubber plantatons include
weekerd at lion acres not all plantatons undude
ber but with large stress of the most santable
land eleared and the trees planted in rows
and the rees are about 1.5 feet apart in the rows
ind the rows are 15 feet apart in which makes

on soon 1 see helpts and meet and the see that of the see that

NUMBER TO PESTS

incear and raw the both conductable gradual manufactures for steasy types and incease and seek and see

ODVITTA OF OUR RUBBER IMPROVE THE

tings pand methods were largely done away total at nonneyan due apresent on make to of plantation rubber brought with it an era can be carred or machined. The production molded while it is still soft or when hard it known as vulcanite or ebonite. This can be the tubber becomes the hard tough material combined with about 30 per cent of suppur the it is prought to a greater heat and dinary tubber of different degrees of clastic s 2 to 10 bet cent of sulphur we get the or dita batead side bendings at it god it god coner duanty This process is called suffern and sol dity and the elasticity which is its computed with sulphur to give it toughness my and it warmed it gets at chy it must be

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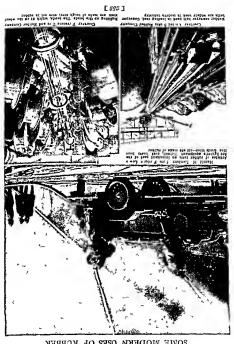
ont pad begun lumied production Valley in Brazil and by the time war broke sion of about 2 500 000 acres in the Amazon 1918 the Ford Company secured a conces screage has increased each year snce in 100 000 acres under cultivation and the Property in Africa By 1941 there were nearly per Company leased about a million acres in by their needs in 1925 the triestone kup per combanies established plantations to sub-Only in recent years have American rub Dutch companies in Sumaira and Java plantations in French Indo-China and some in Africa Prench companies have tions in Ceylon India Valla, and Borneo east Asia British companies have planta plantations are in the East Indies and south the largest n ost numerous and oldert

not to maintain this production to bring a modern plantation into production the trees is only a part of what must be done becomes greater The planting and raising of trees grow older and larger the yield of latex perote any subber is produced at all As the squa of the long process to be gone through smos tegular This in outline gives some ent regions it is greatest where the rainfall though the growth of the trees varies in d fict the number of trees per acre to about 100 quality of latex are removed This reduces nb to the reduced standard of yield and During this time the trees which do not come tree has reached the s ze for regular tapping contribe the toltowing three years of untu the urage This is continued from time to time nee is fall enough for a test tapping to he About hee years after bud grafting the DATE THE TREES ARE EIGHT THAN OLD

ERCOLAR TAPPING DOES NOT BEGIN

ARE

about 220 trees to the sered As the seeds spring up the seedings in each seed bed sire only two of the strongest plants to each bed of the strongest plants to each bed most spread and the one that is most spreading is left standing most spreading is left standing



SOME MODERN USES OF RUBBER

Addus more than 95 per cent of the world a rubber queed at the time of the Japanese invasions ber plantations of the East Indies that prothese seedlings grew the hule system of rub set out on shecrally prepared land from shipped to India Ceylon and Singapore and pugs gien they were carefully packed and New Gardens, in England Il hen the seed ham took were planted in greenhouses at export seeds or plants. The seeds that Wich of good tubber and it was torbidden to the country, as the Brazilians had a monop hevea tree He had to smuggle them out of went to tstazil and collected seeds of the Brazil, so an Englishman, H A lickham the react indice was not so good as that of of superior trees the rubber of Asia and plantations for the planting and cultivation to the prought about the establishment of tubber in the last part of the mineteenth cen ment the demand for a better quality of beobje tet pask to purk sport the improve strong need tor improvement in any article it asney), pebbene that when there is a

tree became georges of white state of the st

ADICUMIZING MUKES EDBREK LYS

to entired universal and an advantage of the process of the mean of the process of the mean of the mea

ors tred to think of ways to overcome this drawbach, and among them nere Charles Goods ear of the United States and Thomas Hancock of England

The great trouble about all such uses of rubber, or cooutchouc, was that in damp, warm neather it became soft and stucky and in cold weather it became stiff. Many invent

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If Do the amble turns in poor, the Studies of the Court o

spelling an Indian name for it gum eacutehoue, which is the French way of bjere account of his findings, He called the tion i and pur und ninere a com tion to south America. While there he inves sent De la Condamine on a scientific expedi closks About 1735 the French government loordranger of mult the gum to waterproof the gum to coat shoes The Spaniards them-Sumpe to pourous vireu and to pue oxizate winned in 1912, tells of the import tree in and used by the natives of Haits in their the clastic halls made from the gum of a tree count of Columbus a second voyage, tells of The historian Herrera, who wrote the acsaid, to the time of the discovery of America. THE STOLA OF LUDDEL ROSS DECK, 25 Ne have

and other queeine By these means it was hoped that, a permanent home employ or inches; and one of the apply or inches; and one of the supply or inches; and one of the plants we have mentioned will give a much would give a certain the breakence and could would give a certain the prodegroup. The plants we have mentioned will give a much would give a certain the production of the world give a certain the production of the plants which or mentioned will give a much give typied or more production of seed and cultivation.



teeth America of successfully welding large attente together with vitali um a non to eat the year est Results were much better than with the year. Results were much better than with the year. Results were method of attempt ng to

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By Thomas Gordon Lawrence

BIOTOCA LT KEZ KALIN I

ondetances similar to penicillin in their who helped develop it as a lifesaving remedy DE Einst B Chain of Oxford University pemeilin and to Sir He vard It Florey and ing of London University the discoverer of medicine was given to Sir Alexander Flem, The 1945 Nobel Prize in physiology and

MOSTD MESE VAVSDED V ROSEF BRIDE THE MEN WHO BROUGHT PENICILLIN TO THE

phoid virus diseases, malaria or the common brevent tuberculosis leprosy typhus ty enther penicil n nor sulfa drugs cure or meningus anthrax and some gas gangrene neart infections some preumonia some against carbuncles blood poisoning some is now established as an effective remedy tive against only a few types of bacteria it cilin Although peniculin is actually effec broduced by a common green mold-pent spirechines eshecially the marrelous juice Intensive research continued with new

เลราเล se boold autison the positive blood is a violent, and often fatal reaction if a negative individuals cells which may cause causes the production of substances in the an Rb negative person, but this translusion stuter for soob boold satisted da lo notsui minte an Kb positive person The first trans translusion of Rh negative blood does not tive those lacking it are Rh negative A with the Rb factor are said to be kin post Dr Philip Levine eight years ago Persons reth of Hb the blood factor discovered by rogiess was made in unveiling the me st

RE PACTOR IS LIPORTANT IN TRANSFOSIONS KHOMING IN Y DEERSON HYS OF BAS HOT THE

afternath of gunshot wounds in the head and the convulsions which are often a serious prain it was found to prevent scar formation tipten film was used to cover the exposed many new purposes In head wounds when I thru film the solid clastic material de-

n qua potralu biorderion to 39 per cent of the children experiment it was found to give con plete und Joung children against measles In an the material of choice in protecting babies laundice It was also said by doctors to be tound to provide a veapon against infectious the Red Cross for the fighting forces was globulin, a by product of blood collected by the blood in medicine and surgery Gamma Advances continued in the u e of parts of sem rollerner the cut ends of the artery

capable of reproducing was found that the mushroom caps were still opened Although the air pressure in the tubes was only about Meso of normal, it had been sealed thirty hie years ago were trated when glass tubes in which mushrooms to endure unlavorable conditions was illus The remarkable ability of some organisms

HAVE (* LEMMIN B. OF C) that our intestinal bacteria also make ribo B (thismin) you it has been discovered enem es some of them manufacture vitamin all of the bacteria in our intestines are It was already known that by no means

passasip os cancers to disappear in 43 per cent of mice that injections of folic acid caused certain permicious anemia One investigator claimed of red blood corpuscies and is helpful in that folic acid swiftly mereases the number attificially) for the first time It was found the vitamin B group, was synthesized (made In the field of vitamins folic acid, one of material

swim away to avoid any contact with the the bodies of dead sharks. The his emonsters pomp composed of substances taken from nearly developed substance It is a stink or aumen can now be prevented by using a Attacks by sharks on shipwrecked sailors ing the growth of certain germs

ins was found to be very effective in check foot fungue and in bacteria growing in the green plant called Chlorella in the athletes nuts burdock buttercups a microscopic ellect on germs were found in water chest





as atsenic compounds Il ithin two or inteeases as malaria can be exterm nated for son for rats one bundred times as ellective insects which carry the germs of such dis laboratory Although not dangerous to numerial por gerous pests it will be a great traumph if combletely withing our some of the most dan ments on the sense of taste in a psychol gy te in view of this success there is hope of this urea) was discovered through experi unisance beers ency as pedbugs and body ATU (wh ch is short for alpha naphth) steeping stekness it also works aga not some one application cattlets of though disentery and Atrican from our jungle fighters for five hours siter and jellow lever and against the insect griefem Tries fant escriupsom san izmege

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By Morris Mondak

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SCIENCE-CHEWISLER

oundiete much for so long was considered elements have been added to the list of mean that in one year four new chemical lity it been thought are confirmed it will 62 and 60, had been created in the labo and that two more new elements, numbers truce of plutonium had been found in nature borts were printed revealing that small quan exist in nature. Toward the end of 1945 re creating two new elements which did not was assumed that man had succeeded in to be uranum (with or protons). At the with the highest atomic number was believed (with 54 protons) Previously the element 63 become in the nucleus) and plutomum produced These two are neptunium (with (NO curriely new chemical elements were in the process of making the atomic bomb ures of nees were supped to the island

unless insects transferred their pollen whole some of the plants would not produce ituits dramed off water may be used again Since außeg in descending steps so that the me of the dry ground The gardens are ar crete is used to keep the nater from sinking the gravel of the reland Asphalt like con ocean to water the plants that are rooted in gardens there using nater distilled from the bebbers I be Army established hydropomic tomatoes radishes, cucumbers and green South Atlantic Ocean, now produces lettuce rocky, dry desert land and cactus in the ponics (soilless chemical gardening) were carried out Ascension Island, a purpoint of Some large scale experiments in hydro onung tot2

wew group of substances called subcome as onne to amore the puts were recently devel bod shall be put were recently devel and the puts were recently devel bod.

Spown here in a piece of chicken factor clots a place of the blick is a process that the chick is the part which is made by places is the confine that the chick is the part of the confine that the chick is the place of the chick is the confine that the chick is the chick in the chick is the chick is the chick is the chick is the chick in the chick is the chick is the chick is the chick is the chick in the chick is the



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DASE IS DEED TO MAKE A REW PLASTIC

upholstery

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A new chemically treated cotton (related to cleaness) will not to even indusp kept most, may be used for awnings and fish nets, is lite-resistant and may be used for

Other fabrics have been furgored so as to make from water profilent, fireproof and water freeze, and waternily and actually strength, durability and waternily and acstrength, durability and waternily and acbape, Linen tablectoirs were coated with a spile of a state of the profile water water freeze, the state of the proting of the profile water freeze, for this group strength of the profile water freeze, for the stream of water, fearing no stain

syn and weave a tree), cloth is made without having to tropical countries by pounding the bark of the exception of the cloth made in some title in the history of the world (with with plastics In this case for perhaps the produced by cementing together cotton fibers Dental tonets almost as cheap as paper nere are now thrown away or used as fertilizer chicken feathers millions of pounds of which dry strength than nool was made from nere introduced A soft cloth with a greater and water in 1945 more new artificial fibers materials as the casein of mile, and coal air peen made from compounds of such unlikely in recent years many new textiles have

the plague controlled as epidenuc of hypus or could be destroyed and an epidenuc of hypus or

days the entire rat population of a city could be destroyed and an epidemic of typbus or the plague controlled

In recent years many new textiles have been made from compounds of such unlikely materials as the casein of milk and coal air and water In 1945 more new artificial fibers were introduced A soft cloth with a greater dry strength than wool was made from chicken feathers milhons of pounds of which are now thrown away or used as fertilizer Dental towels almost as cheap as paper were produced by cementing together cotton fibers with plastics. In this case, for perhaps the first time in the history of the world (with the exception of the cloth made in some tropical countries by pounding the bark of a tree) cloth is made without having to spin and weave

Other fabrics have been improved so as to make them water repellent freproof and weather resisting. They possess greater strength durability and warmh and are less given to wrinkling stirmking and losing shape Linen tablectoths were coated with a transparent film of virnyl butyral Grayu spilled on such cloth may be wiped off with a dampy rag ink may be removed with a

stream of water leaving no stain.

A new chemically treated cotton (related to celanese) will not rot even though kept moist may be used for awnings and fish nets is fire-resistant and may be used for

upholstery

opnostery

Glass fibers are being used more extensively for clothing Exceedingly soft and springly cushions have been made of glass wool

MATERIAL FOUND IN WOOD PULP AND SAW DUST IS USED TO MAKE A NEW PLASTIC

The war made the waste found in some of our essential industries seem a really shock ing thing One material which was formerly thrown away the essential part of wood pulp and sandust called lignin is now being used to make a shiny, black plastic to condition soil and to control dust on roads When paper is made from wood pulp great quan tities of I gain are left unused. A fine quality hard wallboard is now made from wood shavings thips and sawdust by treating these materials with chemicals and compressing them By treating soft woods with the chemi cal methyl urea we can make them as hard as oak or walnut These woods may be made to resist fire and decay may be dyed beau tiful colors and may be coated with standess steel and other metals

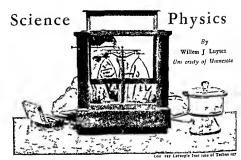


Shown here is a piece of chicken feather clath a pile of the feather and a rail at the years which is made by binding the feathers with a little wool.

A new group of substances called sil conesome of which bounce like rubber but can be shaped like putty were recently developed Active research continued in this field during 1945.

Some large scale experiments in hydro poincs (soilless chemical gardening) were carried out Ascension Island a pimpoint of rocky, dry desert Jand and cactus in the South Atlantic Ocean now produces lettuce tomatoes radubes excumbers and green peppers. The Army established hydropoinc gardens there using water distilled from the gravel of the island. Asphall like con the gravel of the island. Asphall like con crite is used to keep the water from smiking into the dry ground. The gardens are ar ranged in descending steps so that the drained off water may be used again. Since some of the plants would not produce fruits unless invects transferred their pollen. whole

hives of bees were shipped to the island in the process of making the atomic bomb two entirely new chemical elements were produced These two are neptunium (with 93 protons in the nucleus) and plutonium (with 94 protons) Previously the element with the highest atomic number was believed to be uranium (with 92 protons) At the time the news of the bomb was released at was assumed that man had succeeded in creating two new elements which did not exist in nature Toward the end of 1045 re ports were printed revealing that small quan tities of plutonium had been found in nature and that two more new elements numbers 95 and 96 had been created in the laborators. If these reports are confirmed it will mean that in one year four new chemical elements have been added to the list of nmety two which for so long was cons dered complete



the deserted mountain region of New Merico

DURING the year that has passed physically casts were busset than ever They discovered many new facts in nature and invented a bit of new machines and devices and gudgets. Most of them however have been working for the government on war research during the past few years and many of the can fell very little a year and it may be many years before we get the full story of all they did during the last year of the war.

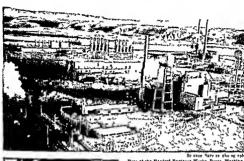
and tuning the 12st year of the way and—and
The greatest thing the scientists did—and
perhaps we may reas say that it was the
way of using the energy of the atoms core in
the atoms bomb Not because it was a bomb
that is something to be used to blow up cutses
and kill people but because for the first time
in the whole history of the world burnan
beings have found the secret of what it is
that keps the sun and the stars shuning

Before they could make the bomb they had to find out what goes on inside the atom and this took fifty years of study one generation of scientists handing to the next its discoveres Not August 5 when the first bomb was dropped on Hiroshima hat July 16 1045 will be a red letter day in the history of science. That was the day when the first atomic homb was et off at Leo Mamos in

the deserted mountain region of New decision.
There after years of hard work and many disrippointments and discouragements that were almost heart breaking scientists knew they had succeeded at last. They had opened up the termendous store of power inside the tiny atom.

When the news came nearly all the world was suprepared for i, and must people am ply could not believe is—except the children in Americas who had read the came stops and knew all about Buck Rogers and Superman and Christian Marvel and the other nut acke men 'The children were really more came to the children were really more came to the children were really more than the children which are forward to the children with the children which are the children which were considered affair which is true fame of all make-believe, is the greatest mane of all all.

The whole story of how it was done may not yet tell Some of it you will find in the chapter on Atomic Energy, but a good deal of it is dangerous knowledge and the sourcements had about it has of the sourcements and the sourcement of the sourcemen



Here of the Hanford Engineer Works Pasco Washing tion steret production work on the stomic bomb took

haps better than anyone else that if we all want to go forward we must all work to gether and must share the things we know and the new things we find out To the scien tists our earth has been One World for a long time Now that we know the secret of atomic

energy and know at least how to use it to get an explosion, the next thing to do is find out how to use it in everyday life-to fly our amplanes and drive our locomotives and per haps even heat our homes and run our wash ing machines with it Perhaps some of you who read this chapter will help to solve the problem

We can mention at least one other triumoh of physics. Even though it did not all happen during the year, it was published during the year We mean RADAR It too played a very important part in the winning of the war, as far back as the Battle of Britain in the fall of 1040 At that time the English used it to tell them when and where the Ger man planes were coming over So they were able to use their own few planes in the right place and to beat back the Germans

The idea of radar is really very simple it is like a blind man who walks around tapping



A technician operates an electron microscope in the

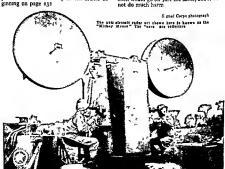
the ground with his cane when be comes close to a tree his cane will tell him where the tree is and he can step aside and not bump into it. In radar we use instead of the cane a beam of invisible light. When it hits an object it bounces back to us and we get the erbo of it.

The farther away an object is the longer it will take for the beam to come back. Radar can be used by those on the ground as we have explained to scan the distant skies for approaching craft. In peace or in war its beams can be sent out from ships to guide them through darkness and log and into strange harbors. During the war with Japan it directed the fire of guns against ships far out of sight. It is also valuable to polots.

If a plane is flying in a cloud prised soft is beam in all directions and on the state ments as we now have them a luminous finger spins around on a screen When a beam bits something a light spot appears on the screen and the pilot gets a rough picture built up from these light dots of the object at a distance Even on a clear day the radar eye can see ten times farther than we can with ordinary light. Exactly how it works.

can with ordinary light Exactly how it works you will have to look up in the article be ginning on page 232 Radar can usually see through a cloud But when the clouds mass together and become ever heavly laden with rain they too will bounce some of the radar beams back In this way the burreane that struck Mama Florida in September 1945 was spotted on the radar screen and followed all along its course. The Weather Bureau is already thinking of putting radar to use for weather

predictions There was one very special way in which radar was used in the war that we want to tell you about By mounting a radar sending set in the nose of a shell such a shell or homb could be made to smell its target Before this when firing shells at airplanes for ex ample either the shell had to be set to ex plode when it hit something or it carried a time-fuse which made it explode after so many munutes In the first case the shell would actually have to hit the plane If it missed by even an inch the plane would es cape unburt. In the second case one would have to guess somewhat in setting the time of the fuse and hope that the enemy plane would be somewhere near when the bomb went off If there wasn't any plane near, the shell would go off just the same, but it would





A Rayal Air Ferce humber is shown landing at a for-covered abroost with the aid of FIDO-For Invest setton Dispersal Operalism. This British investice burns guession along both sides of the runway to dissalve the tog

Now with the new built in radar set beams are sent out in all directions from the shell The time it takes for such a wave to go out get bounced and come back is recorded inside the shell by a little machine When this time of going and coming back is short enough then the object-a plane perhapsis close enough to be damaged or destroyed by the explosion of the shell Before it is even fired the shell is set to explode for just that time and that distance Destruction of the target is thus made certain. Some experts estimate that with such radar sets built into rockets or let planes loaded with explosives such planes could be guided toward their target like homing pigeons. They would explode at the right time without any human guides being in the planes at all. In this way it might be possible to meet an enemy fleet of bombers a hundred miles away from their dest nation and explode the buzz bombs among them That would make it almost impossible for planes to get near big cities

We do not know in detail how the present atomic bombs were exploded. But in the fu ture they, too could be exploded by using radar sets built into them

We want to mention one more contribu tion the physicists made to the war That is the log-disperser-the British call it FIDO This is really not much more than a great bg heating unit that burns thousands of gallons of gasoline per hour and blows the vapor into the a r Fog-dispersers are used around airfields and when a dozen or so of them are lined up all around a landing strip it is possible in a short time to blow away,

dissolve even the densest fog that may hang over the feld Hot gases rise as you know In rising they must push up and aside the heavy dense foggy air This device was specially helpful when a large force of planes that had been out on a mission would come home and could not land because of the dense fog By the use of FIDO in England and in the Aleutians the lives of many pilots were saved

A few physicists have still been working on research that had nothing to do with the war especially on cosmic rays and what they really are They have been trying to find out more about that new and strange particle that we call the mesotron-what it is and where it comes from It seems that when the first cosmic rays-which are really protons that is small part cles that carry positive electricity-strike the upper layers of the air they produce mesotrons up there Sometimes these behave like fast electrons the very I gbt particles that carry negative electricity Sometimes they behave more like protons themselves only they seem to be a little lighter

Other things the physicists have been working on are new ways of testing precious stones such as diamonds with V rays and ways to examine the surfaces of solid bodies with the electron microscope And of course a great deal more has been done in the line of splitting atoms of changing one chemical element into another and of trying to learn how the nuclei of these atoms that is the central cores way inside the atoms, are built up





Sylvenia Electric Products soft, rastful effect to lighting is falled by pincing Superscent Lamps continuous cores to the celling or the waits about the windows. The bitter Sutures are thus be con-

glaleg pleuly of light bot

By Samuel Baker

Dean, Schools of Technology, International Correspondence Schools SCIENCE, the word comes from the Latin know exactly what everything in the universe is made of, and how He searches for the laws of nature by which all things are ruled, from the energy within the atom to the motions of the distant star-cities. For thousands of years men have been adding to the sum total of human knowledge and this accumulation of knowledge has helped each genera tion to live a little more comfortably This is true, at least, in the part of the world where we live There are still places on the globe where science has made almost no headway In those places, life is simple, and hard There is little protection against disease homes are uncomfortable, and the forces of nature are feared

A motion picture of the onward march of civilization, or science, might be made around the changes in home construction Take one element-the arrangement for cooking our food Once an open fire in a cave sufficed. though it filled the cave with smoke Then came a hole in the roof to let the smoke through, next, a chimney to provide a draft But much of the heat, as well as smoke, went up the chimney, so stoves were invented. The stoves burned wood, and they had to be refueled constantly Coal was found It burned leger, and more evenly, but it was dirty, ashes made a problem, and there was still an element of guesswork in cooking Your grandmother's recipes called for "a medium

oven," or "a very hot oven " Modern cook books are made by scientific cooks All meas urements are exact, including the degree of heat and the number of minutes at which the heat must be maintained Today stoves can be purchased that burn gas or use electricity, and have automatic heat controls and time controls. Some ring a bell to remind the housewife that now she must take her cake out of the oven Some turn the oven off at the right moment

Stoves of tomorrow will be even more ad vanced, for their designers will put to use even more of the findings of science Heat will not be wasted as it is today in top-of the-store cooking Arrangements for fireless cooking, and for quick cooking by steam under pressure will be built into the stoves

The stove of tomorrow is only one piece of equipment in the kitchen of tomorrow, and the kitchen is but one foom in the home of tomorrow Let us see what the architect has to say about the house that science will build for us to live in and enjoy

The new home is planned to meet the needs of our new ways of living Ever since the first World War, women have been en tering lines of work that were formerly fol lowed only by men This trend is expected to continue It means that in many families the wife as well as the husband will go out to work, not so much through necessity as through choice Where there are children in the home, the mother will need more and



Courtesy Owens III no a Glass Co-Glass will be need in meny mere ways in the houses of the future The glass waits turrenading the working space in this kitches give more deplight for the housewife They are good looking themselves and cost to keep them.

more time to devote to her family Therefore the new home must be easy to run

Advances in technology will continue to shorten the hours of labors on that adults will have more time for hobbies and outdoor recreation The activates is aware of this He knows, too, that improvements in transportation are making it possible for more people to live farther away from the crowded cities. The planning for the new homes therefore, gives more attention to spaces for recreation and for living outdoors.

The average home of tomorrow will be a low, rambling building without cellar or attic. The scientific advances which make it possible to build this kind of house are the result of long research and experimentation in types of building material in methods of heating and air conditioning and in the development of electrical component

The beating and air-conditioning equipment will be in a room on the ground level rather than in a cellar. The kitchen will be an efficient little factory, equipped with labor saving devices mostly electrical, for cooking dishwashing and laundering.

In many homes there will be no separate duning room, but dining space will be provided in the part of the living room nearest the kutchen. The bedrooms will usually be on the ground floor, in a separate wing of the house. If there is a guest room, it will serve



Courtesy I abby Owens Ford

The gives well which brings the entdears fate the Hring room is made of a special insuleting glass made of the or more pease with a realed in dehydrated air space be tween them. It lets in the sunshine but not the cold air.



Courtesy The Tappan Stove Company A gleening white gas steve which has automatic heet estalled, a lighted even with a window livregh which you say see the food confine and other helps.

also as den for unused space will be avoided There will be plenty of bathrooms plenty of closets and built in dressers and other furm ture Overcrowded fussy rooms will be avoided

Some of these new houses give the impression that they are all windows. Thus too so something which scientifications are something which scientifications are something which scientifications are something which scientifications are something to the scientification of the scientification of the scientification are something to the scientification of the scientification are seen to the scientification are seen to

Some of the new important developments in naturals used for home buildings are the work of the chemists. These scientists have learned how to impregness the strength its durability and its resistance for fire. They have also made paints that are waterproof and resist free.

The use of plywood as a building material or for production of furniture has been greatly expanded by discoveries in the new field of plastics. Plywood is made by gluing together several thin layers of wood with the grain in each layer at right angles to the grain in the adjoining layers. This makes tough wooden sheets for use in walls and ceilings. When such sheets are impregnated with a transparent plastic, plywood panels show clearly the natural beauty of the wood.

To increase safety in moving about the house at night luminescent or phosphores cent plastics will be used for switch plates lamp shades and bases telephone receivers and starway rivers and railings

More use will be made of metals eqecrally aluminum magnesium and stainless steel for window sashes and other structural and decorative purposes

By applying the principles of physics and chemistry new methods of heating and air conditioning have been developed which make houses both healther and more com fortable. The new heating system will be easier to operate than those to which we have been accustomed. In the oen system known as radiant heating bot water or steam is sent from an automatically fired heater or boiler thmugh coils of pipes embedded in the floor and sometimes also in the ceiling and the walls If a hot air unit is used the hot air is sent through ducts in the floor Thus with radiant heating there are no rad ators or registers. In hot weather, the house would be cooled by pumping chilled water through the radiant coils of a hot water system, or cold air through the ducts of a hot air system



Washing dishes can almost be fun when your kitches has an electric dishwasher like this.



Courtesy Deep Press Mater Products Corporat on In such deep-feesing units as this, people with he side to store track foods, including meet, milk and vegetables preserving all their resonance.

The term air conditioning has come to mean more than merely cooling the house in summer. It now means also adding mosture to the air and heating it in winter removing excess moisture and cooling in summer and year round filtering and cleaning of the air ome of the filtering methods depend upon new uses of electricity.

Advances in lighting have made the old massive ceiling fixtures with their glaring lights seem entirely out of date Scientists, experimenting with electricity and its effects or metals and gases under various conditions have developed fluorescent lamps which create the color of daylight Fluores cent lights have little glare and give off much less heat than is given off by the lamiliar incandescent bulbs. The fluorescent lamp may be the chief means for lighting the home of tomorrow A soft luminous effect for gen eral I ching is furnished by using continuous coves in the ceiling or in the walls above the windows with hidden fluorescent lamps in the coves Where strurger fight is peeded direct "downlight" is built in-for example, over the reading chair or the dressing table or the kitchen stove

If we attention is being given to arranging the I ghting so that it will blend quietly with the decorative scheme of the house. Foor large without cords are promised. The cur rent will depend on vacuum tubes.

A radio-television receiver equipped to receive sound and visual programs, will be mounted in a place specially designed for it in the home of tomorrow. It will have facilities for inscribing sound programs on disc or wire records and for playing them when designed.

Radio programs will come into the home with greater realism to a result of the fur ther development of frequency modulation or FVI, sound in its full range and brilliance will flood the atmosphere: and no discordant crashes of natural or man made struc will mar the performance Television in full color is promised. The home town parade or the lookball context a fashion show or drace will be seen as well as heard in or an operation of the will be seen as well as heard.

I honograph records will be unbreakable They may be in the form of plastic discs (some of which we now have) or wire Or they may be steel tapes in which the sound pattern is written magnetically

The radio nutries of the family as about to return a figure a switch will turn the radio into a facsimile recorder which will sainly grain away all through the night and in the morning will supply a printed copy of the latest news 'ny thing that can be put on paper—printed matter writing photographs and cartions—will be reproduced on the facsimile recorder of the home This will by no means take the place of our This will by no means take the place will be reproduced to the fact will be recorded to the control of the place of our fact of the place of th

State the labor saving devices and many of the mechanisms that are now operated by hand will be more effectively controlled by electronics in the home of tomorrow controlled by electronics in the home of tomorrow controlled by electronics and the near engineer of a person. Many of the ardinois or distactful tasks in the home will disappear when the lacts known to science today are put to general use in the home of thomorrow.

Homes touted the best garden called sail and besting, hipe piccod between sail the sail ing of the boom below give as each temperature to best repeat and also said also said the sail temperature to best repeat and also said temperature. The force and





Albert Einslein who has charted new palbs in science

THE Golden Age of Science is right now Since 1900 discoveries have come so thick and fast that we have room here only to mention some of the most interesting and

important ones in the Yiddle Ages every alchemist hoped that he would be the fortunate discoverer of the philosopher's stone that wonderful some thing which was believed to have the power to change base medials such as lead or iron mot precous gold As the philosopher's stone did not evist, it remained undiscovered The quest was given up as hopeles.

About a hundred and forty years ago, John Dalton decided that the adoms was the tunest particle of matter that could exist and that the atoms of the different elements were essentially different I Flow could one atom be changed into another? Impossible But twentiethecentury physicists have done the impossible. They have changed one the

element into another! The story of the modern version of the philosopher's stone begins in the middle of the philosopher's stone begins in the middle of the discovery the modern an electric current is passed through the passed of the passed

SCIENTISTS of the GOLDEN AGE

By Thomss Gordon Lawrence

We call these particles electrons, and electrons we now know are bits of energued matter in atoms. Thomson found that all electrons are identically the same no matter from what type of atom they come. So now we have something smaller than the atom and this something is the same in all atoms.

some day sometimes in the same in all atoms of the control of the

vancturity helped to solve the nodde Ruh erford and Sody then went to work on ra form which is far more active than thorium body to the solve the solve that the state of the solve the solve that the state of the solve the solve the solve the solve that practice is 1 negative that produced the solve that the solve the solve that the solve the solve that the solve that the solve that the solve t

tagging them]
In England in 1907, Rutherford allowed alpha particles to enter a glass chamber from which the particles could not escape Exam mag the chamber laten he found no alpha particles to the found helium gas. The extension was that the alpha particles were really as the state of helium atoms—two men and the state of helium atoms—two men and the state of the st

that every atom consists of a nucleus having a positive charge and surrounded by nega

tively charged electrons

Rutherford reasoned—if all atoms consist of electrons surrounding an outcless, could be change one atom into another by changing the nucleus? He knew that this takes place in nature in radioactive elements Could be make this happen to other elements? He needed a bullet that could be shot into the nucleus of an atom But where was there a bullet small enough and powerful enough? The answer was—the tiny alpha particles themselves, which travel at a speed of more than 10,000 miles a second

In toro Rutherford bombarded netrogen gas with alpha particles from radium rays Some of the nitrogen atoms changed to ovegen! True, in 49,999 cases out of 50 000 the alpha particles sailed right through the nr trogen atoms without disturbing them But in one ease out of 50,000, the alpha particle crashed "just right" into the nitrogen nucleus and stayed there, at the same time knocking a proton from it Thus the nucleus gained two protons and lost one, making a total gain of one, and changing its atomic number from 7 (nitrogen's number) to 8 (ov) gen's number), but changing its atomic weight from 14 to 17 (The alpha particle contains two neutrons, remember, and a neufron has about the same weight as a proton)

THE ALCHEMISTS' DREAM—CHANGING ONE ELEMENT TO ANOTHER—COMES TRUE

So, with Rutherford's wonderful experiment nitrogen had been changed to heavy oxygen! One element had been changed to another! What the alchemists had deramed, Rutherford had accomplished! We have come to think of this operation as "smash ing the atom."

in 1935 the process was actually photocraphed by a feaver called the cloud-charn ber. In 1910, another Cambridge physicist, C.T. R. Walson, had devised this chamber for the purpose of photographing the paths of ultrameroscopic charged particles, particles too small to be seen under the merosoope. This is the way it helped Sudden expansion of most air which filled the chamber caused the temperature to drop and water vapor condensed about any charged particles which happened to be in the chamber The path of these particles could now sort the particles which happened to be in the charlet and the particles which happened to be in the characteristic particles are sort of the particles of the particles which happened to be in the charater The path of these particles could now sort of the particles of the path of the particles are particles and the particles of the particles which are particles of the particles of the warmon were available for physicists. Robert Andrews Millikan (1868), the son of an Illinois preacher, achieved fame by isolating and measuring the electron For this work he received the Nobel Prize in physics in 1923

THE STRANGE RAYS THAT BOMBARD OUR EARTH FROM DISTANT SPACE

Now Millikan began to investigate certain mysterious rays of which physicists had begun to take note around 1000 Rutherford had found them annoying because of their ability to penetrate thick screens of lead and otherwise upset perfectly planned experi ments Did these rays originate on earth? Millikan sent pilot balloops carrying instru ments as high as ten miles, reaching into the stratosphere. The mysterious rays were stronger the farther from earth the balloon rose They finally were seven or eight times as strong as on earth Definitely the rays did not originate on the earth. In addition the rays were shown to be equally strong day or night Evidently the rays did not come from the sun either Were they cosmie in origin? That is did they come from the vast spaces among the stars

Millian traveled to the far reaches of the earth to measure these cosmic rays Everywhere he found cosmic rays at the tops of mountains, in valleys, deep below the surface

of lakes

Another American scientist Arthur Holly Compton (1892-), came to believe that cosmic rays were really charged particles traveling at terrific speeds

Following the work of J J Thomson and others, it was agreed that the atom, instead of being a tiny solid mass is really mostly space, with a comparatively heavy nucleus in the center and with electrons revolving about the nucleus. The nucleus contains one or more structures called protons, each of which has a positive electric charge and weights almost is 850 times as much as an electron. Each electron has a negative electric charge. Further details on the structure of the atom are given on page 48

The idea that electrons spin around the Bohr (1835.) Two American scientists Irving Langmur (1881.) and Gilbert N Lewis (1875.), continued the study of the structure of the atom.

Tou remember that Mendeleef classified the chemical elements according to their weights. A twenty six year-old Fight-man Henry G J Moseley (1887-1915), made a better arrangement—a table of elements ac-



Sir Ernout Entherford

cording to atomic number (\tomic number is the number of electrons in the atomwhich is al course equal to the number of protons in its nucleus) Moseles was killed

at Gallipoli in World War I What is matter? Before the time of Dal ton most people thought that a piece of iron was solid all the way through The atomic theory indicated that all matter is composed of particles called atoms and that there are spaces between the atoms J J Thomson Rutherford flohr and the rest showed that the atom itself is mostly space. But what are

the electrons and the protons and the other hits within the atom? Are they tiny hard solid bodies? The French scientist Louis Victor I rince de Broglie (1892 gested in 1924 that the electron reself must

be thought of not only as being a tiny par ticle but also as consisting of a group of waves similar to the waves of light! The Austrian Erwin Schroedinger (1888) and the German Werner Heisenberg (1901

), have developed ideas like those of De Broglie

In 1913 F W Aston (one of J J Thom son's many brilliant punils) discovered that in some elements not all of the atoms have the same weight Atoms which do not follow the general rule are called sociopes Aston discovered an isotope of the element neon About 300 isotopes have been found since incliding to for tin Uranium has several isotopes. The famous one is uranium 235 Ordinary uranium has weight 238

Anotl er famous isotope heavy bydrogen was discovered by Harold C Urey (1893) at Columbia University in 1932 The atom of heavy bydrogen has an atomic weight of 2 twice that of ordinary hydrogen Water in whose molecules heavy hydrogen takes the place of ordinary hydrogen is called heavy water The heavy hydrogen is called deuterium

Discovery of heavy hydrogen opened up a new feld of research If heavy hydrogen is substituted for ordinary hydrogen in fats and the fats are fed to animals, we can later find out what happened to the fats in the animal's body by following the course of the heavy hydrogen molecules Heavy hydrogen can be called a tracer element because we can truce its course through the animal's lis sues Radioactive tracer elements sod um and phosphorus have been used by John H Lawrence (brother of Frnest Orlando Law rence) and flerbert Vf Lvans (1882)

to find what the body does with chemical substances

In 1934 frene and Frédéric Johot Cune produced the first artificially made radio serve substances including radioactive alu minum an I mitrogen. Thus the Curie family continued to pioneer in the work in radioactivity for frene is the daughter of Mane and I terre (urie

Rutherford's work had opened the question of atomic power. The force which holds atnms together is tremendous. If only a por tion of this energy could be released for use scientists figured we would no longer worry about using up all our coal and oil supplies, for in atoms we have an inexhaustible supply of power Madame Curie had noticed that as radium broke up energy was released Ruth erford and his co workers had noticed that when they but an atomic nucleus with an alpha particle energy was released in large quantities

LAWRENCE BUILDS A BIG MACHINE FOR SMASHING LITTLE ATOMS

Freest Orlando Lawrence an American physicist (1901) used a 60-ton mag net to which he added another 25 tons of equipment to build an 85 ton machine called a cyclotron for smashing atoms In 1934 this cyclotron changed platinum to rridum and gold When iron was bombarded some of it changed to cobalt and manganese while some became radioactive. Some thirty four different elements were subjected to the action of the cyclotron, and all were changed to something else

Bot more than that uncharged particles called neutrons were knocked out of the nuclei A neutron is about as heavy as a proton-it is said that a thimble packed with neutrons would weigh a million tons-and since a neutron has no electric charge it makes a better bullet than an alpha particle Why? Because the electric charge of the alpha particle sometimes proves a nuisar ce

The neutron carries no charge (An alpha particle, being positively charged meets

some resistance from nuclei.)

For his work with this 85 ton cyclotron

Dr. Lawrence was awarded the Nobel Prize
in physics in 1939. By 1940 he had built a
225 ton cyclotron at the University of Cali.

Another type of atom smasher is the Van de Graaff generator developed by Robert Van de Graaff of Alabama (1991) Bot's the cyclotron and the Van de Graaff generator although they work m different ways are designed to accelerate subatomuc particles to great speeds for bombarding atoms

Before World War II started in 1939 at was known that it a heavy atom like that of uranium could be completely broken up controus amounts of energy would be ho erated. If the atom was even split in two (thus forming two new atoms of lighter chemical elements) the amount of energy released would still be fantasticately great although only a fraction of what would te will from the complete destruction of the

Now when energy is suddenly liberated anything that stands in its way is pushed aside with such violence that we have an explos on Some explosions are useful with when we use them to run a gasoline engine. Other explosions are violently destructive such that the top of a volcano blows off or a B 29 drops its bornho load.

THE RACE TO DEVELOP THE WORLD'S MOST TERRIBLE WEAPON

There was a fearful race between nan securities and those of Great Britann Canada and the United States to develop the atomic bomb which gets its titianic power from the smashing of atoms. There is poetic justice in the fact that among the most important scientists on the Albed side were distinguished exiles driven out of Germany and

Idaly by the Nams and Fascasts
Up to 1539 more work had to be done to
smash an atom that was released in the form
of energy when the atom res smashed. But
in 1939 German physicasts including Otto
Hahn (1879) | fired neutrons at ura
mum atoms and scored a bull seye. At first
the stentists were not entirely sure of what
hear results meant to the protected that the
not present before) and that enormous quain
titles of energy had been released. The en
erry production was on a scale far above



Arthur H Complen noted for studies of cosmic rays and Irving Langmuir anibority on the structure of alone They had a part in developing the atomic bomb

anything noted before in atom smashing Less Meinter (1875) and R O Frisch (1904), both soon to fite from Ger many because of their Jewish ancesty found the explanation The uranium atom had split into two new atoms one of barum and one of the rare gas krypton. More im portant was the fact that while the neutron that but the uranium atom had one thrifteth of a volt of energy the uranium atom shot out 100 000 000 000 volts—set billion times as much energy at was put into it.

Fortunately for civilization two of Europes greatest experts Entroe Ferm who had been exiled by Mussolini and Nels Bohr of Demark, who escaped during nazion occupation were working at Columbia University Dr Frisch sent the news of the breaking up of uranium to his father in law

Bohr
As the life-and-death struggle in Europe
got under way President Roosevelt saw to it
that American and British efforts were
pooled Many of the greatest scientists in
both countries were involved in the work

It was Fermi a idea that when the uranium (or other) atom was struck by a neutron and split other neutrons would fit out from the broken nucleus. Now if these would hit still further atoms and split them a chain re actors would still gridler atoms and split them a chain re actors would still gridler atoms and split them a chain re actors would still place the place and the final er ploson would be on a gigantic scale It was found that ordinary uranium (weight 235) was not suitable but that the rarer uranium offerences in sever found in nature had been made impliminam and politonium both heave than uranium 218 Apparently most of the explosive material in the atomic bombs dropped on Japan was politonium. We tell dropped on Japan was plottonium.

you more about the atomic bomb in the story of atomic energy, page 53

So far there is no immediate puspect for any practical use of atomic power except in warfare. It has been said that if all the protons and electrons in one drop of water were to destroy each other, enough energy would be evolved to supply 2,400 horse power for an month. When atomic power is finally taimed for peaceful use, we may expect a revolution in moustry as great as that pro-

duced by steam and electricity

During the latter part of the mnetecenth century scientists worked out the strange events which take place when the micles of the cell divides—the strange dances of the chromosomes called mitcoss and reduction drivinsim With the knowledge biologists were ready to carry on the work of Mendel when it was re-discovered in 1900 The English Unlough William Bates in 1867 1930 and 1900 per the strange of the properties of the pro

EXPERIMENTS ON THE TINY FRUIT FLY PROVE NEW IDEAS ABOUT REPEDITY

William E Castle (1867-), of Har vard University, found the ideal creature for experiments in heredity, the fruit fly some times called the vinegar fly The fruit fly grows from egg to adult fly in ten days, lives in perfect health in the laboratory, and has only four pairs of chromosomes Every laboratory in the world where bevelity is studed now has its rows of pint milk hottles.

housing hundreds of thousands of fruit flies. Thomas Hunt Morgan, Immos as the founder of the gene theory, was born in Zertron and the properties of the properties of the published his results. In 1000 Morgan studed thousands of fruit flies to see if any of them would show the mutations be Vives had sentise about in 1910 a mutant white the properties of the properties of the same year Morgan found that has flies produced fifteen of normal relevant flies of the properties o

One of these students, Hermann J Yuller (1890), produced artificial mutations in fruit flies by bombarding the parent flies with X rays Soon after two other American scientists, L J Stadder and T H Good speed, artificially produced mutations in plants Man now was not only able to change one chemical element into another, he could also produce new types of organisms in one generation.

Back in 1901 the American scientist C.E. McCling (1876)—) had argued that the sex of grasshoppers was determined by cer tain small chromosomes. Morgan's students one of whom was his wife, Lillian V. Vor gan, produced abundant evidence to bear out this theory. Mrs. Morgan helped explain the mheritance of sex linked traits (the fact that women are rarely bald, for example, and the strange cases where a normal mother' can.

transmit hemophilia, the bleeder's disease, to her sons, but not to her daughters)

Albert I Blakedor (1874) of the Caracter Institution, found that sometimes the chromosomes would fail to divide in a plant, with the result that new types were produced with double the ordinary number of chromosomes. The new plants with the extra number of chromosomes turned out to be very different in many cases from their parents Soon it was found that by applying colchience, a possessous juice extracted from the autumn crocus, these chromosome doublings could be produced artificially. Hence, many the control of the grown with the control of the grown and what the new true, will be a work of the control of the grown and what the new true, will be a found to the control of the control of the control of the grown and what the new true, will be a found to the control of the c

what the new type will be)
Thanks to Morgan and his students, including Alfred II Sturteriant (18pr – 1
Calvin B Bragges (1859 pg/8) nummary

of the tiny chromosomes of the fruit fly
These maps show the exact location of those
mysterious structures along the chromosomes which are called genes, and which de
termine hereditary characteristics, such as
pols, and clube fruits.

AR ECLIPSE OF THE SUN TESTS THE THEORY OF RELATIVITY

On May 29, 1079, parties of scentists were gathered in Africa and Brazil, at opposite sides of the world Tension was high All the apparatus was ready—the telescopes, the cameras, the spectroscopes Now everything depended on the weather Would it be clear? Or would clouds obscure the total eclipse of the sum for which they were warting?

At the same time Albert Einstein sat quertly at home in Berlin He had every rea son to be nervous, for these scientific expeditions were going to test his theory if the echipse was not obscured by clouds, photographs would be taken which would show once and for all whether Einstein was correct in stating that light rays bend as they pass close to a bulk like the sun. The photo graphs were taken and Einstein was shown to be correct. He had started a revolution in the world of physics.

Albert Einstein was horn at Ulm Ger man, May 14 189 In 1894 Albert went to Zurich, Switzerland where he supported himself by teaching physics and mathemat ics while he studied at the unnersity. He was a tather lonely man and shy He became a Swiss citizen and tool, a position as patient examiner in Berne He continued his studies at the University of Zurich and got his de green as Dottor of Philosophia.

In 1905 Linstein published his Special Theory of Relativity This tool, the scien tific world by storm and his reputation was assured In 1913 Berlin created a position for him—director of the Kaiser Withelm I hysical Institute and he was elected to the Royal I russian Academy of Sciences

In 1915 he published his General Theory of Relativity When his theory was tested by scientists all over the world many honors came to him, including the Vobel True in physics in 1917 Elization Studies contain the same and produce of our universe—space time and motion—in exact mathematical figures a thing no scientist hid ever I een able to 60 Tor years fen minds were able to grasp his prodlems or to follow his thanking very closely and even today it takes a student of standing of his theories.

NEW DOORS TO KNOWLEDGE ARE OPENED BY ALBERT BINSTEIN

Einstein and others have shown that Issae Newton's Law of Gravitation has certain timy defects when applied to matter in outer space. These modern scientists have made suggestions for chunes in Newton's physics. The really, great lang Einstein has done has been to keep scientists aware of the magnitude of the control of the space of the spac

In the days when the Naus ruled Ger many, Albert Functon was driven from the country and stripped of all his belongings He made his way to the United States, and from 1933 to 1945 he taught mathematics at Princeton University. He became a naturalized citizen of the United States.



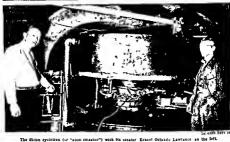
Press \text{\text{tent} and not like their Paris inducation like like Paris inducatory Ireas Curis and her husband four Press Curis on additional work of Marie and Pierre Curis on a polipacitivity

One of the most fascinating developments in recent steence has been the etudy of hor mones those secretions produced by glands which make people grow tall or short fat or thin active or mactive By means of thyroid extrict the type of idot called cretin has been made mentally normal while other hormores have been used actually to change the set of animals—hens into roosters for example

More and more we are probing litto the secrets of the hung cell On January 17 1913. Dr Alexis Cartel (1873 1914) a French Stenius who had come to the Lolted States operaed a hen's erg and cut out a tiny veloping the cheef. Today that it out a tiny veloping the cheef. Today that it puts of health It grows so fait that half of it is cut off and thrown away trace a week. Other biologists have deconvered bow to grift parts of various lower ammats, so that the can the the beginning that the control of the control of

Almost every day the newspapers carry accounts of new discoveries in the field of drugs and vitamins. A wonderful discovery was pencified to the developed from a wold which checks the growth of hirmful bacteria. It has been discovered that the bacteria is that she may be a support of the discovered with the product and many fungal product antiseptia which render a similar service.

In the field of chemistry, new materials



we find the distinction between matter and

such as new plastics rubber like materials synthetic precious stones and new metal al lovs are announced frequently Among the most marvelous of the recent inventions is the electron nucroscope which focuses streams of electrons instead of light waves and enables us to make pictures of objects one-fiftieth the size of the smallest thing visible with the best light microscope

We must remember that the findings of science can be used for man a destruction as well as for his benefit. Due to science men no longer die like flies in great epidemics of plague and yellow fever and they need not suffer from many ills which were common only yesterday But science also makes it easier for men to kill each other and to wreck cities and whole countries with a speed un dreamed of until recently

Science has not been able to make hving

things from non living matter The great questions as to the ultimate na ture of matter and energy remain questions and it is here that the language of the specialist is probably most difficult for the student to understand When we get to the smallest particles of matter the electron and the proton we find it hard to say just what they are They have what the physicist calls mass and they have electric charges Another fundamental particle the neutron has mass but no electric charge. We used to beheve that matter was very definitely one thing and energy something else-yet now energy breaking down

In living bodies it has been found that many (perhaps all) life processes are closely tied up with electric charges. All nerve ac tion involves electricity. Hence the doctor can tell an epileptic from a normal person by differences in the electrical waves of the brain Absorption of materials through liv ing cell membranes seems to have some electrical basis

In chemistry it has been found that matter is electrical in nature. The electrical nature of atoms accounts for their ability to com bine into molecules Atoms of one element have been transmuted into atoms of differ ent kinds merely by adding or subtracting electrically charged particles in the nucleus as we have seen

Radio waves, light rays ultraviolet rays \ rays, gamma rays are all electromagnetic disturbances differing from each other only in wave-length and frequency of oscillation All this seems to support a oneness about the universe a unity in the natural laws un der which the universe operates Albert Ein stem expressed this idea in 1905 when he suggested that matter is simply concentrated energy and that energy can be converted into matter and matter into energy

For every discovery and every problem solved new problems loom up Perhaps this is just as well There will always be work for the young scientist to do

OUTSTANDING 20TH-CENTURY SCIENTISTS

Sit Joseph J Thomson (1856 1940) English Dis covered the nature of cathode rays Made impor tant contributions to electron theory Proposed

Max Planck (1848) German quantum theory of energy Won Nobel Prize in physics rat8

Sir William Henry Bragg (1862) and his son William Lawrence Bragg (1890-) English Investigated the arrangement of atoms in crystals Joint winners of Nobel Prize in plays

George Washington Carver (1864 1942) Amera can b othernist Thomas Hant Morgan (1866 1945) American

Founder of the gene theory of heredity Won Nobel Prize in medicine 1933

Theodore William Richards (1868 1928) Ameri can Determined the atomic we ghts of chemical elements with great accuracy Won Nobel Prize in chemistry 1914 Robert Andrewa Millikan (1868

obert Andrewa Millikan (1868) Ameri can Measured tharge on the electron Norfied with cosmic rays Won Nobel Price in physics

C. T R Wilson (1369-) Scottish Invented cloud chamber which makes it poss ble to photo graph the trail of an electron or other sub atomic

particle Won Nobel Prize in physics 1927 Erneat Rutherford (1871 1937) New Zealander important experiments on nucleus of atom

Changed one element into another Won Nobel Prize in chemistry 1908 Walter B Cannon (1871) American Stud

led work of glands and relation between emotions and vital functions

Alexis Carrel (1873 1944) French Kept chicken heart tussua alive for many years Non \obel Prize in medicine 1912

William D Harkins (1873) American Pre deted the discovery of the neutron Albert P Blakealen (1874) American Ex

perimented on heredity in plants Charles William Beehe (1877) American Explored undersea life in bathysphere Authority

on birds Frederick Soddy (1877) English With Rutherford discovered three different kinds of rays given off by radium Won Nobel Prize in

chemistry 1971 Lize Meitner (1878) born in Germany Co operated in pl ting uramum

Albert Ematern (1879) born in Germany now an American citizen His theories have caused a revision of fundamental ideas about the universe Won Nobel Prize in physics 1921 Otto Hahn (1879

tto Hahn (1879) born in Germany Ds covered (1918 with Lise Me iner) radioactive element protoactinium Wan Sabel Pruse so chem Istry 1944 Chaton J Davisson (1851 3 Amer can

known for researches in electricity magnetism and radiant energy discovered (with L H Ger mer) the diffraction of electrons by crystals (1927) Shared Nobel Prize in physics 1937 Str Alexander Fleming (1881) English Dis-

covered penicill n in 1918 Shared Nobel Prize in physiology and medicine 1945 Irving Langmuir (1881) American Helped to develop the electron theory is on Vobel Prize

in chemistry 1932

Herbert McLean Evans (1882) American Important work with hormones and vitanuas Roy Chapman Andrews (1884 Discovered dinosaurs eggs and other fossils

Niels Boht (1885) Danish Worked out a theory of stomic structure Won Nobel Prize in physics 1912

Henry G J Moseley (1887 1915) English Es-tablished table of atomic numbers of elements from the action of X rays) Austrian De Erwin Schroedinger (1888

veloped the idea that matter may be thought of as consisting of waves Won Nobel Plaze in physics 1933

Hermann J Muller (1800) American Pro duced artificial mutations in fru t fl es Tames Chadwick (1801) English Discovered

the neutron Won the Nobel Prize in physics 1935 Prince Louis Victor de Brogle (189 French First to state that the electron may con

sist of waves Won Nobel Prize in physics 1979 Arthur H. Compton (1891) American Borked with cosm c rays Studied effects of Y rays on electrons Won Nobel Prize in physics

George P Thomson (1891) English Son of Joseph J Thomson Produced evidence to show

that electrons behave like waves Shared Nobel Prue in physics 1937 Harold Urey (1893) Amer can Invest gated

heavy hydrogen and heavy water Winner of heavy nymogen amount 1934 Nobel Prize in chemistry 1934 Vone) Finnish Won Arttura I Virtanen (1895

Nobel Prize in chemistry 1945 Sir Howard W Florey (1895) Englah Study of persoull in in 1939 Shared Nobel Prize

in physiology and medicine 1945 Isador I Rabi (1808) American Made an

estimate of the dameter of the neutron Won Nobel Prize in physics 1944 Jean Frederic Jol ot (1900) and Irene) French Artific ally produced Curse (4807

radioactive elements Joint winners of Nobel Prize in chemistry 1935 Wolfgang Pauls (1900 3 born in Austria

Wen Nobel Prize in physics 1015

Werner Heisenberg (1907) German Ds covered the principle of uncertainty" This means that acente can not know both the exact velocity and the exact postion of an electron at the same time Won Nobel Prize in physics 1931

Ernest Q Lawrence (1901) American De veloped the exclotron the atom smasher thin ner of Nobel Prize in physics 1939

Enrice Ferms (1907) Italian Important work in development of atomic bomb

Wendell M Stanley (1904) American D scovered that certain disease-causing viruses are actually crystalline proteins I Robert Oppenheimer (1994) American

Directed atomic bomb research in New Mexico Carl D Anderson (1905) American D scov eced the posteon (or postive electron) a par t cle of the same mass as the electron but with

a positive electric charge, Won Nobel Prize in physics 1936 Ernat Boria Chaln (1006-) born in Germany Development of pen clin Shared Nobel Prize in

physiology and med cine 1945



By Samuel Guy Inman

BRATH is n t nly the largest country in South America, he is the forth largest country in the weld. If you in ag ne an area, the size of the United States with one myre state as 1 g, as Texus, at led 15 it you will have a good idea of the size of litar I.

To the people who I se in it is in mense territory events of great importance came crowding thick and fast in eafter snother

all dur ny 1945

To been not the Brazil was going all she hal to deleat Germany. There was no time for illeness at the an bases in the log Brazilian illes the nearest politic Moral and Swith America Brazilian illustrational format had I funed these bases to the United States is botten the air distance agric sitch Vilinic.

In Brazil's easters cit es along the in that the working full that they produce a louist along the Amazon Vales thousants thousants they were struggling to in

crease the production of desperately needed cubber

While Brazil was helping to win the war her people were being ruled by a dictatorial government and they were restless Before the year was over revolution broke out in Brazil as you shall see

In spite of discontent at home, Brazil co-operated with the United States in many important ways No ally could have been more staunch Brazil was one of the members of the Vievico City Conference and gave her approval to the famous Act of Chapultepec which you may read about in the article on Mexico in this ANNUAL

BRAZIL JOINS IN THE WAR AGAINST JAPAN AND RATIFIES THE UNITED NATIONS CHARTER

Brazil declared war on Japan on June 6 1945 This was welcome news to the United Nations for at that time it looked as if the war in the Pacific was going to be long and

very diff cult Later in the year Brazil took part in the San Francisco Conference She ratified the Charter of the United Nations on Septem

ber 8

In all of Brazil's history there has never been anything like the progress she has made in recent years. The man who led Brazil in this swift growth is Getulio \ argas He has done more for the economic development of his country than has any other ruler

Vargas was president of Brazif But he exercised the powers of a dictator With the end of the war Vargas was nearing the end of his long years of rule. He had seized power in Brazil in 1930, and for fifteen years he had given the people no chance to elect another president Now most of the people and a large part of the army were clamoring for the right to choose the r own president in a free election

DICTATOR VARGAS IS FORCED TO RESIGN AND GENERAL DUTRA IS ELECTED PRESIDENT

Vargas promised to give Brazilians what they wanted All through 1945 he had held out the hope of an election. He even set the date for December 2 But the general feel ing was very strong that a man who had been so long in off ce would want to continue

Late in October the army forced Vargas to res gn In accordance with the Brazilian Constitution the Chief Justice of the Su preme Court would act as president uptil an election could be held And so Chief Justice Jose Linhares was sworn in as Brazil's tem porary president The United States officially

recognized the Linhares Government on No vember 2

lose Linhares carried out the promise that Vareas had made A presidential election was held on December 2 Seven million five hun

dred thousand persons registered for this election General Enrico Gaspar Dutra was elected the president of Braz | Getulo Var gas was elected senator for his state

HOW THE WAR BROUGHT THE HORTH AND SOUTH AMERICAN REPUBLICS TOGETHER IN ACTION

One of the finest results of the war is the new spirit of co-operation between most of the republics of North and Soi th America Brazil shows us many outstanding examples of this spirit One instance of the friendship between Brazil and the United States is the story of an old ship which was sent on an important mission

On November 10 1945 an old naval transport steamed into New York Harbor Her name was the Duque de Caxias and she was flying the Brazilian flag Six months earber she had been called the Orizaba and

she flew the Stars and Stripes

Travelers well remember the old Orizaba in the days before the war when they en joyed many happy voyages aboard The United States had turned the Orizaba over to the Brazilian Government in July Re christened the Duque de Caxias her business was now more serious. She would sail home carrying the last of the several hundred Bra zilian veterans who had been wounded in the Italian campaigns and who had then been sent to the United States to recover

UNITED STATES AND BRAZILIAN SOLDIERS HAD FOUGHT SIDE BY SIDE IN WINNING ITALY

Carlier in the year on July 18 Rio de Janeiro Brazil's great capital had welcomed the return of other veterans of the Italian campaigns These were some of the troops of the Brazilian Expeditionary Force What a tremendous burst of joy greeted them as they poured down the gangplanks! They were given a wonderful ovation and as a mark of the good will between their country and the Un ted States they were reviewed by a United States general who had just come from Italy himself-General Mark W. Clark

In the long gram struggle in Italy the men from Brazil and the men from the United States had come to know each other well They ga ned new respect for each other and new friendships were formed that will help both countries to understand each other better now that the war is over



Brailles coldiers bewing the decks at Rio do Issoiro The Erstilles Expeditionary Force joined with its either Allied forces in driving the Germans out of Italy They were given a transcodous reception upon arriving home

This war marked the first time that Bra zilian soldiers ever fought on European soil They fought under North American generals and used guns and tanks made in North America

One of the most important projects that Brazil undertook was her effort to grow rubber in the Amazon Valley Rubber is vital in war and there was a desperate short age of the natural product because the Japa nese had seized the great rubber plantations of Java and Malaya Brazil and the Umted States speeded up the production of rubber in the Amazon Valley The Brazilian Gov ernment sent thousands of workers there Immediately their health became a problem Fevers and heat make the Amazon numeles dangerous to people who are not used to living in that region The United States sent many doctors and nurses to guard the health of the rubber workers

The Amazon Valley may become more and more important in the future. It is quite possible that it will become one of the rub ber centers of the world. And it may become the home of many of the homeless refugees of Europe.

Brazil s great West is as untouched as the western part of the United States used to be a century ago Stretching far unland the Amazon Valley is one of the largest and richest undeveloped areas on earth Millions of refugees could settle there with from to

spare and build themselves new homes and find new hope for lwing. One difficulty is that it would cost a great deal of money is make the valley a good place for them to live Science would have to tackle the prob lem of sanitation. Great quantities of food would have to be raised and modern farm machinery would have to be introduced.

Modern industry is already through in the cooler region along the eastern coast Sao Paulo is a great industrial city—the second largest city in Brazil and the third largest in South America With a population of about 1 500 000, Sao Paulo claims to be the most rapidly growing city in the world

On the road between Sao Paulo and Ro de Janeuro lies Volta Redonda with its mest steel mill. For the first it me in their lives thousands of workers in this mill are living so modern homes and sending their children to school

Every great war is followed by new and difficult problems. After World War II many countries were faced with the supproblems that twodled Brazil Lawing controlled Brazil Lawing controlled Brazil Lawing controlled Brazil Lawing conposed to the superior of the state republic merchant of the state republic Her laborers needed better houses More schools were needed too as well as new shools were needed too as well as new lawing the superior with the superior superior superior lawing available to more Brazillastic.

But Brazil's greatest need was for a democratic government and you have read how she solved this problem What happened in Brazil with the coming of peace happened also in many other parts of the world People who had been denied the right to vote and to express their opinions demanded these rights. In South America there was a growing shift away from dictatorship toward democracy There were two more revolutions in South America in 1945-one in Venezuela that succeeded and one in Argentina that failed

The revolution in Venezuela took place in October The president of Venezuela was Isalas Medina Angarita On October 19 some of the officers of the army revolted against President Medina and forced him out

of office

Caracas the capital was thrown into a turmoil Part of the army remained loyal to Medina and there was fighting between the two groups with riots and looting and bloodshed Romulo Betancourt succeeded Medina as president, but he had to win his position and hold it by the armed strength of his supporters. He was confident of vic tory The next day-October 20-Betan court assured the United States Embassy that be would soon restore peace and order On October 21 several other army garrisons joined Betancourt's rebel forces and Medina and members of Medina's cabinet were

in custody Betancourt had triumphed As provisional president Betancourt zuela until an election could be held. He promised to help his country establish a democratic government He also promised that delegates would be elected to draw up a new constitution and he promised to hold a presidential election as soon as possible

enezuela has always been governed by a few people who seemed not to be concerned with the country's welfare. One of its most famous dictators was Juan Vicente Gómez who died in 1935 Since his death two of his generals ruled Venezuela-General Lopez Contreras and General Medina

For years Venezuela has depended for most of her income on her oil and her big ranches The Betancourt Government has appointed a commission to see what can be done to give Venezuela other sources of in come It is boned that the development of manufacturing and of various kinds of small

business may be the answer

Lenezuela is made up of small states loosely linked with the central government The Betarcourt Government appointed a commission to study ways for the Govern ment and the states to work more closely together in order to improve the health of the people to give them a better education and to build up a prosperous business life from which all would benefit

The revolution in Argentina did not end on such a hopeful note The government of Argentina is still a dictatorship

Argentina has long been South America's problem child During the war Argentina



James Sawders capital city of Pera & Cur k to the Spa

very last moment. Argentina did not declare war on Germany until March 27, 1945, when Allied victory in Germany was a certainty. The German surrender was only a little more than a month away. Argentina also declared

war on Japan on March 27

When rebellion broke out in Argentina in October there was hope for a little while that a democratic government might take the place of Argentina's dictatorship. This

hone was short lived

Juan D Perón was the dictator of Argen tina His title was vice president but he had more power than the president Edelmiro Farrell because he was able to make Farrell obey his orders

Perfor ruled his country with methods very much like those of Hitler and the Nazis Peron was in control of the police who had been trained in the use of machine guns and other deadly weapons Some of the labor unions and a large part of the army also supported Perón Many of the common

people, however longed to overthrow him. There had been many demonstrations against this dictator. One of the largest demonstrations took place on September 10 in Buenos Aires the capital it was estimated that 500 000 people took part. They carried banners They sang songs of freedom. They

shouted I na la Democracia"-Long Live

Perfon's unlitary government arrested many of the demonstrators There followed a reign of terror In protest more than 30, 000 university students went on a nation wide strike on October 3 Many students were arrested Riots took place which the police put down by firing into the crowds The Government even occupied the six na

tional universities of Argentina
Doctors lawiers and other professional
and business groups joined the demonstration on the side of the students and of de
mocracy Finally on October 9, 1 erôn resigned.

But the leaders of freedom were slow to act and they were not so highly organized as the supporters of Peron The dictator all led his forces round him and headed a counter revolution On October 17 Perón was back in power He did not take a government offce but he was still the Stroog Man of Argentina controlling President Farrell and the country.

A presidential election was scheduled to be held on February 24, 1946 Peron an nonced that he would run for the presidence.

Danners They sang songs of freedom. They

Other countries were troubled about Ar

A street in fotioniti. Siver

Early the street of the street

United States and other American republies to change their attitude several tim's Ar gentina was not present at the Inter Ameri can Conference in Mexico City in the early part of the year But she was taken buck into the Pan American family of nations after she had declared war on the Avr- and signed the Act of Chapultepec

ARGENTINA IS ONE OF THE UNITED WATIONS BUT HAS STILL REMAINED A DICTATORSHIP

Argentina asked to be invited to the United Nations Conference at San Francisco The United States and Latin America voted to invite her because they hoped it would help to bring constitutional government back to Argentina This hope was not fulfilled Although Argentina ratified the United Na tions Charter (September 8) she was still a dividing force among the countries of the Americas at the end of the year

In striking contrast to Argentina Teru swung to the left in 1945. The July elections for president were won by the Liberal and leftist candidate, Jose Luis Bustamante Ri \ero

Peru was the home of aristocracy during colonial days when Spanish grandees ruled the land When the country won its inde pendence, it did not become a democracy but a republic in which a few men had all

Some twenty years ago a group of students led by a brilliant young man named Hava de la Torre decided to start a movement to change Peru into a democracy They were of course vigorously opposed by the Govern ment and some of them were exiled Other reform parties joined this movement and after many years they finally won the victory for which they had struggled

A LONG STRUGGLE FOR DEMOCRACY IN PERU IS FINALLY RESULTING IN GREATER FREEDOM

The press was granted freedom of expres sion Labor was allowed to organize teachers could express their opinions freely and the National Congress was allowed full liberty of debate

When Haya de la Torre who had been living underground, addressed a huge crowd in Lima the Peruvian capital, he said We do not want bread without liberty or liberty without bread

It is to be hoped that Peru will be able to achieve both bread and liberty But she has a long way to go before those who have been deprited of freedom of expression can truly understand what liberty means They



Ving det Mar Chile s most teabionable seasife resurt. will need to learn that discipline and a respect for the rights of others are a part of

freedom in a democracy I eru declared war on Germany and Japan on February 12 Two days later along with Paraguay Chile and Ecuador she became a member of the Lnited Nations Peru ratified the United Nations Charter on October 15

As the year drew to a close two countries -Peru and Venezuela-eemed to have been added to the democracies in South and Cen tral America. These include Uruguay Chile Colombia Mexico, Cuba and Costa Rica Turning in the direction of democracy were Guatemala El Salvador and Ecuador

On the side of dictatorship were Argen tma Paraguay, Bolivia the Dominican Re public Haiti Honduras and Nicaragua

It was clear that throughout Latin Amer aca the common people had been so stirred by the war that any dictator might lose his 10b overnight

We should remember that much of South America has been replated from world affairs for a long time Now however this isolation ts changing New schools are being built More and more people are learning to read and write New books are pouring from the printing presses

Communication among the different coun

PLRUS COUSIN OF THE CAMELS



Chief beast of burden in Feru is the likum It had been in use since the days of the loca; and the Span self. [280]

tries and between North and South American improving rapidly. The Pan American highway and new airplane routes are being pished. More and results are coming in the province of the province of the province are of the province of the province of the braith of the people are also very important changes.

It has been said that one test of civilization is the way a nation treats its children. If you believe that this is true, you will be interested in what Chile is doing for some of its children.

Santiago, the capital of Chile, is building a Children's City in one of its suburbs it will consist of about thirty buildings for orphans and forsaken children. The buildings will be named viter American republies and heroes. There will also be schools a

hospital, a library, and a theater Boys and girls in North and South Amer tea can do a great deal to further Inter American friendship lians, schools might like to follow some of the suggestions that were made in the distant land of Chile These suggestions were recently mide by Chile's Vinnster of Education. He put them in a builtim that he sent to all the pupple of

WAYS IN WHICH SCHOOL BOYS AND GIRLS CAN HELP TO BUILD INTER AMERICAN FRIENDSHIP

Read about the life of some notable citi

zen of each American country Celebrate the independence day of each

republe.

3 Tr3 to understand the life of these coun
tries especially through their music
dances and legends

4 Study the history and geography of each

5 Read the papers for news of these republics and send a note of sympathy when a national catastrophe overtakes one of

them
6 Study the work of such organizations as
the Pan American Union, the Rockefeller
Foundation and the Red Cross, and the
things they do to help the peoples of the

Americas understand each other
Form Pan American clubs in your schools
Exchange letters, student publications
and photographs with students in other

countries

Keep a map of the American continent
close to your school flag

A program such as this carried out by a number of schools in American countries



hotograph from European

Democratic patriots in Buenes Aires Argenties, recently staged a big parade called the Morch of Constitution and Liberty The photograph shows a crewd of promp color guards leading marchers to the Plaza del Congreso

SPORTS REVIEW

By Leo Waldman

Courtesy of A G Spilding & Broz, Inc

DASEBALL once yearn turned out to be the proce of refutance on the 1945 varied sports calendar floth the American and Androad Baseball leagues und subted his staged nece to be forgot en pennant races in their respective circuits—probably the most closely contested and dramatic battles ever attaged buy our rational pattien—with the Dictoix Tigers and the Chicago Cubb hay company with the covered champton change with the covered champton.

Detroit staving of a late challenge by the surging Washington Senators Chucked the American League pennant on the final day of the season when Hark Greenberg who re joined the team in mistian mer after being for the senation of the season when Hark Greenberg who re pointed the team in mistian mer after being Forces as a capitan hat a hone true with the bases full in the minth initing against the St. Louis Browns to give his train the hereis sary trumph by a 6 to 3 score. This certainly meant turning the false because these same Browners mored out the Tagers and the 1042 command on the very last day of the 1042 command on the very last day.

the 1944 cumpany.

The Cubts didn't make their followers suffer in anxiety until the final playing dayfer in anxiety must be final playing daymental to the pest to final day of the season beating the Pittsburgh Pirates in a
doubleheader The tina victory cut short the
St. Louis Cardinals ambitents of winning
their fourth successes flag Billy South
worth a team had won the busting in 1932
1943 and 5944 and the manager pain missed
or 1944 and 5944 and the manager pain missed
main triumples printly held by John McCenw
and Joe Wickerline.

This was the seventh American League pennant won by a Detroit team but the first for Steve O Neill as manager. He finally achieved his ambition after fifteen years of managing teams at Toronto Toledo Cleve land. Buffalo. Beaumont and finally Detroit



O Neill however was the No 1 catcher of the Heveland team which won the American League pennant and beat Brooklyn in the World Series of 1920

Detroit was far from the greatest team ever to win a pennint Most of the club stars like those of other teams were on lies? The stars like those of other teams were on lies? The stars of the club stars of the c

Despite the lact that he had been as the AF Forces for four years serving in India China and the Pacific Greenberg was just as good as ever when he reponde the Tigers And his big hat was the decid ng factor and the permant race. It was that same but Greenberg who knocked out fifty eight become the permant area. It was that was the permant race is not seen as the permant area was a town Bine Tuthin as in Innie mappe, league record according to the official records printed in Spalling as Baselall Guide

Hal Newhouser Faul (Dzzy) Trout and Altan Benton were the pitching standouts for O'Nell's forces Newhouser twenty four pear-old southpaw, won twenty five games tops in both major leagues Trout despite the fact that he was bothered by a sore arm won eighteen Benton came up with thitteen conquests Detroit took over first place on June 12 Washington moved within a half game of first place or four different occasions but one or another of these three star pitchers came through with a stellar performance to keep the team on top of the standings.

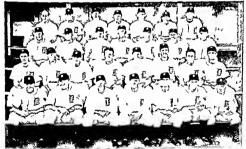
In capturing the National League flag its systemth since 1876 the Chicago team established a new record for most pennants won It had presvously been tied with the New York Giants each with fifteen Jolly Charley Grumm managed the Cubs in their winning drive—the fourth time he has been with a pennant winning Chicago nine. He was the list baseman on the team which won in 1939 and he was manager of the aggregations.

which came out on top in 1932 and 1935. The Cardinals and Brookhn Dodyers gave the Chicago team a touch run for the big prize during the season but the Cubs had an outstanding pitching staff burlers who were at their best when the pressure was on and this advantage proved the difference There was Hank Wise consistent all season and owner of twenty two tri umphs Hank Borowy, purchased for 5700 000 from the New York Yankees in mid season timed out to be a bargain purchase season turned out to be a bargain purchase

winning eleven games and losing only two And three old timers. Claude Passeau. Paul Derringer, and Ray Prin taught the young opposing batsmen a few tricks and they turned in a combined total of forty six conquests.

Phil Cavarretta like Greenberg with the Detroit team was the big gun in Chicago's attack. This slick fielding first baseman wielded the most potent but in the major leagues capturing the National League bat ting crown with an average of 355-par ticularly outstanding when compared to the 300 which won the American League honors for Ceorge Stirnweiss second baseman for the New York Yankees Ably assisting Cavar reita in banging out hits were Andy Lafko Leanuts Lowrey Bill (Swish) Nicholson Stan Hack and Don Johnson These fence busters helped the Cubs sweep twenty doublehenders during the season -an advan tage which went a long way in deciding the race

The tino pennant winners came together in the forty second World Series classic and again they staged a thrilling show They fought hammer and tongs right up to the seventh and final game but Detroit boasted the best pitcher in baseball in Newhouser and he proved to be the difference as the Tiesers won the series four game sto three



Beseball a world thempians for 1945, the Detroit Tipers won their trown by besting out the Weshington Scatte for the American League pennant, and then whipping the Chicago Cube of the Notional League in the World Series

TEAM

Pct

108

The final standings of the teams in both the American and National leagues as reprinted in Spalding's Baseball Guide follow American League

Delroit	88	65	575
Mercor		us.	2/2
Washington	87	67	563
SI Louis	81	79	336
New York	8	71	533
Cleveland	73	73	503
Chicago	71	78	47
Boston	71	83	451
Philadelphia	52	2g	347
Va.	t onal League		
Chicago	98	56	636
St Louis	as.	59	617
Brooklyn	95 87 82	67	563
Piltsburgh	82	72	532
New York	18		513
Boston	78 67	74 85	444
Cincinnati	61	93	396

Philadelphia 45 200 Chicago won the opening game with Bor owy hurling a 9 to 0 shutout but the Tigers evened it up when Virgil Trucks fresh out of the Navy turned back the Windy City nine 4 to 1 in the second game Passeau turned in the best game ever pitched in a World Series holding the Tigers to one hit for a 2 to-o triumph and again giving Chi cago a one-game lead Trout put Detroit back on even terms with a 4 to 1 victory in the fourth clash And then Detroit took the lead for the first time in the series when New houser coasted to an 8 to-4 conquest The irrepressible Cubs fought back and evened the series at three games all with a dramatic twelve inning 8 to-7 victory. But in the deciding game Newhouser had the stuff to hold the Cubs at bay while the Detroit sluggers paced by Greenberg and Richards bunged out a q-to-3 triumph for the world's cham monship

It was Detroit's second World Series championship and it had scored its only previous one over another Chicago team in 1935 Cramer led the Detroit batters with a percentage of 379 but Greenberg was the big slugger, socking two home runs and but ting in seven tallies Cavarretta paced both teams in hitting with a mark of 423 bot he received little support from his Chicago team motes Richards was the bero of the most important victory the final game when his two crashing doubles knocked four runs across the plate. This was Chicago a seventh straight World Series defeat since their last championship back in 1908

It was the richest World Series ever played A total record crowd of 333,457 for

the seven games boosted the final receipts to a new high of \$1 592,454 It was the fif teenth Si ooo ooc series in forty two years The previous record for receipts was \$1 322 328 compiled when the Tigers and Cincin nata Reds met in 1040 Each Detroit player received a winning share of \$6,445 while each Chicago player earned the smaller slice of \$3 970

The score by mnings of the seven World Series games follows 11 L Per

Detro t (A L) 4 3 573 Chicago (N L) 3 4 429 RHF First game at Detroit— Cheago (N.L.) 40 Detroit (A.L.) 00 403 000 200-9 13 and Livingston Newhouser Baster es Borowy Benton (3) Tob a (5) Mueller (8) and Richards. Second game at Detroit-Chicago (V L) 000 000 100 000-I Detroit (A L) 000 040 003-

Batteries-Wyre Er ckson (7) and Gillespe Trucks and Richards Th rd game at Detroit-R. H E.

Charo(V.L) 000 200 100-3 Detroit (4 L) Ratteries Passeau and Livingston Overmire Benton (7) and Swift Richards (2) Pourth game at Chicago-RHE

000 400 000-A Chicago (A I) 000 001 000-1 Baller es-Trout and R chards, Prim (4) Vandenberg (6) Ir chan (8) and Li ingston



Fith game at Chicago— RHE
Detroit (AL) 001 004 103-8 11 0
Chicago (NL) 001 002 201-4 7 2
Estitens—hewbouser and Richards Boromy

Batteries—Newhouser and Richards Borousy Vandenberg (6) Chipman (6) Dermager (7) Erick son (9) and Livingston Sixth game at Chicago— R H F

Sxth game at Chicago—
Detroit (A. L.) 010 000 240 000—7 13 25
Chicago (Y. L.) 000 041 200 001—8 15 3
Battenes—Trucks Caster (t) Bridges (6) Benton

Battenes—Truck Caster (5) Bridges (6) Benton (7) Trout (8) and Richards Swift (6) Passeau Wyse (7) Prim (3) Boro vy (9) and Livingston Wilbins (10) Seventh game at Clucago— R. H. E.

Seventh game at Chicago— R. H. E. Detroit (A. L.) 510 000 120—9 1 Chicago (N. L.) 100 100 010—3 10 0 Eatternes—Newhouser and Richards Swift (8) Boroxy Derringer (1) Vandenberg (2) Enckson (6) Passeau (8) Wyse (a) and Livingston

The owners of the sixteen major league teams appointed a new high commissioner of basehall Senator Albert B (Happy) Chan diet, on April 32 to succeed the late Judge Kenesaw Mountain Landis who had ruled the game since the establishment of the commissioners office back in 1910 Chandler forty six years old had been governor of Aenticky twice and a member of the United States Senate for two terms. The new boss of basehall was born in Versaulies Aenticky, obtained his college degree at Trans Nama and his legal education at Harward. He re signed from the Senate in November to it.

President Harry S Truman honored base ball by taking in the Vashington St Louis game at Griffith Stadium in the Capital on Septiment of the Stadium in the Capital on Septiment of the Stadium in the Capital on President Truman has long been a baseful fan and frequently attended games as a senator He del not throw out the traditional first ball at the opening game of the season because it occurred during the mourning period for the late President Franklin Del and Roosevelt

There was one no hat game during the season and it was pitched by Dick Foolier the entry-one year old righthander for the Philadelphia Atthicts who was making his starting and the entry-one of the philadelphia Atthicts who was making his starting and the entry of t

The year's Most Valuable Player title was awarded in the National League to Phil Cav aretta star first baseman of the pennant win ming Chicago Cubs In the American League Hal Newhouser, ace lefthanded hurler of the



Photograph by Bert Morgan courtesy The R der and The Winding the first hast of the historic Hambictonian trotting classic at Goshen, New York us August S

world's champion Detroit Tigers, won the

After the season's close the Boston Braves announced that they had signed Billy South worth as their 1946 manager Southworth who had led the St. Lous Gardnals to three straight pennants, parted amicably with Cord president Sam Brasdon in returning to Beantown where he once played as an out fielder. The Card has reported that their new manager would be Eddie Dyer Iorner direction of the St. Louis farm closs.

More Ians watched major league baseball in 1945 than ever hefore Five leams passed the million mark in paid admissions. Detroit Chicago Cubs New York Nankees New York Giants and Brooklyn and the overall total for the sixteen clules soared to the retord high of 11 373 185. The previous record was 10 481 891 made in 1940 Detroit had the largest individual 1945 high with 1380 318.

MOST OF BOXINGS CHAMPIONS SERVED IN THE ARMED FORCES DURING THE WAR

Boxing made a tremendous contribution to the war effort during the last year \ir tually every divisional champ on served in some branch of the service Joe Louis the heavyweight king was a technical sergeant in the Army Gus Lesnevich the light heavy weight hoss Tony Zale middleweight king and Freddy (Red) Cochrane the welter weight ruler all served in Uncle Sam s Navy Bob Montgomery the lightweight title hold er New York version were an Army uni form Willie Pep and Sal Bartolo co holders of the featherweight crown the lormer rec ognized in New York and Connecticut and the latter by the National Boxing Associa tion served in the Army and Merchant Ma rine respectively Manuel Ortiz the bantam weight kingpin also served in the Army and Peter kane flyweight title holder from Eng land served in the British armed Iorces Only Ike Williams who is recognized as lightweight champ on by the N BA, was not able to serve in the armed forces because of a physical handican

Louis whose real name is Joseph L. Bar row was awarded the Legion of Merit for exceptionally meritorious conduct in the performance of outstanding services, ing in European Mediterranean and North Mirian theaters and volunteering his services at considerable risk to his boying future as heavyweight champion of the world

Louis and his chief heavyweight rival Billy Conn were both discharged from the Army an September and immediately plans were put into operation to bring the behe mothe together in another big light prob ably some time during the summer of 1946 it will be recalled that Louis successfully de fended his crown against Conn a few years ago by knocking out the good looking Pitts burgh battler in the thrittenth round. The time records of both of these performers are bated in Spaliding's Boxing Goule Louis now thirty one years of age had been in the tained more than 2 so one one with ethylic to bouts earning two battle stars in addition to the Legion of Merri medal

Red Cochraine the wellerweight champy on was ducharged from the Nay as a chel petty officer and he immediately started reasons for another title—but his one was training for amount for amount for a compared to the control of the the

public speaking and physical education He

had served in the \avy close to four years

mostly in the Facific area
Fep had a distinctive home He served in
both the Navy and the Army—the only in
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both May earl in right by the server
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led to the Navy early in the Army deched he was phissically fit and again he vas
in uniform He received his second discharge
ched he was phissically fit and say in the server
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Seen in a ring has lost only once IKE WILLIAMS CAPTURES THE LIGHTWEIGHT CROWN FROM JUAN ZURITA IN MEXICO CITY

Besides the Pep Terranova title bout there was only one other champonsh p fight during the year Ike Wilhiams, a resident of Trenton New Jersey won the N B 4 lght weight crown from Juan Furita of Mexico via a thard round knockout on April 3 & be fore a capacity crowd in Mexico City Williams however, will never be classifed at a great champion. In four meetings with Wille Joyce of Cary, Indiana, Williams lost three times the last on June 8 at Madison Square

Garden-all non title affairs One of the hardest hitters ever developed among the smaller fighters came up from the ranks He was Rocky Graziano a twenty year old youngster from Brooklyn Only an unheralded club fighter a year ago the Ital ian lad skyrocketed to fame by knocking out five consecutive opponents at Vladison Square Garden The fight fans always go for a knockout artist and Graziano attracted a total of \$400 000 in gate receipts for these five bouts. The biggest gate of the indoor season 18 540 fans and \$103 970 in receipts was recorded when Graziano knocked out Harold Green in three rounds on September

20 1045 England crowned a new heavyweight champion for Great Britain and the British Isles when Bruce Woodcock knocked out the veteran defending title holder Jack London in the sixth round Woodcock only twenty four eight years younger than London kept his record unblemished with his twentieth consecutive victory nineteen of them re

corded by knockouts

The b g news in the track and field world was furnished by Gunder (the Wunder) Hagg Sweden's haberdashery salesman and probably the greatest distance runner of all time On July 17 in a meet at Malmo Swe den Hagg clicked off a world record shat tering mile in 4 01.4 Th s surpassed the previous standard 4 02 6 made by Arne Andersson also of Sweden and Hagg's chief rival on July 1 1943 And the four minute mile long cons dered an impossibility by many leading track and field experts is now within reach In fact Hagg has announced

that he will do a mile in four minutes before he retires from running

Following is a brief summary of some of the mde records through the years as I sted

ın Spaldı	ATRIETE A D CO NTRY	Time
YEAR	ATRILETE A D CD CIAL	
x365	Webster England	4 44 3
	George Fng and	
1831	Iones Un ted Stales	1 2
1913	Taber Un ted 5 ales	4 20
1915	Taber Un ieu 3 aics	10.
1923	Nurra I nland	4 00
1931	Lo loumegue France	1 06
	Cuna ngham Un ted States	oti
1934	Wooderson England	134.1
1937	Hagg Sweden	
1042	Hagg Sweuch	1 1
-,	Hagg S eden	10
	Andersson Sweden	
1943	Hagg S eden	40
1945	Hags o coen	m nate

The New York Athletic Club dom nated the 1945 outdoor competition Tle Winged Foot retained the national AAU senior title with 74 points at Randall's Island New York with the New York Pioneer Club sec ond with 48 tallies And the Winged Foot also won the national junior team honors with 59 points The I ioneer Club was aga n second with 50 points

Roland Sink nineteen year-old youngster from Los Angeles was the big surprise of the outdoor nationals by capturing the coveted t 500 meter crown in what may be the be ginning of a long reign as America s prem er miler A Navy student at Harvard Sink beat Tommy Quinn of the New York AC ten yards in 3 58 4-which is equivalent to a 4 16 mile. The time was not particularly fast but the 100 degree temperature spoiled any chances for record performances

The United States Naval Academy came up with the best outdoor track and field squad in the colleg ate ranks and the Mid



des retained their Intercollegate AAAA outdoor team champonship with 85½ points—a record total—and also won the Januaria Carlo and total—and also won the University of Illinois won the Control State of Illinois with the Linted State Whita; Academy while the Linted State Whita; Academy on practically experit of the Carlo accounting for each of the Carlo accounting for even of the eight champonship relays

FORMER FORDRAM MILER JIM RAFFERTY WINS TEN STRAIGHT RACES ON INDOOR TRACES

Jim Raffert), the only nine years old and a graduate from Fortham eight years ago was the big star of the undoor company, which was the star of the undoor company to the star of th

ministry at the Boston Theological School Hagg and bis countryman Haakon Lid man visited the Ln ted States during the in door season but neither was very successful Hagg lost all of his four races and constantly complained that the American indoor banked tracks were not suitable for his type of run ing Lidman, a hurdler won a few races

but an injured knee hampered has trained. Segment Fanh. Farher retained his lop ranking as the country soutstanding tenus player. The segment statuoned in the Pa player. The segment statuoned method for the particular training to the particular training to the particular training to the particular training to the particular training t

Although he failed in the singles Talbert win two other championships. He tensed with I teutenant Gardner Mulloy and won the national doubles honors by bearing Avas tion Cadet Bob Falkenburg and Jack Tuere This was the second time Taibert and Mul loy won the doubles after They also turned to the control of the control o

Pauline Betz of Los Angeles winner of the women's national singles championship in 1942 1943 and 1944 lost the chance of equaling Helen Hall Jacobs feat of winning lour consecutive titles by succumbing to Mrs. Sarah Palfrey Cooke, of Boston 36 8 6 4 Mrs. Cooke wife of Elwood Cooke also one of the country s top players before joining the Navy had retired from competition after winning the crown in 1941 and she celebrated her return to the sport by gar nering her second championship.

While Miss Betz failed in seeking her fourth title Louise Brough and Miss Os borne succeeded This combine teamed per feetly and won the nomen s doubles title for the lourth successive year conquering Miss

Betz and Miss Hart 6 4 6 4

Byon Nelson worde the years up male athlete was Mr. Golf of roas The thirty three year old links artist won almost every important dournament from coast 10 erolled up vectories in such places. Mr. Grand Fr. Worth All in all he won mine the notion of the words of the words of the words. The words of the

The United States Golf Association the body which controls the National Open the National Amateur and the National Public Links tournaments again canceled these four major factures because of war conditions. But soon after V J day the association an nounced that all four tournaments will be resumed in 1945 after a lapse of four years.

With the European war over the British P GA tournament was resumed and Corporal Charley Ward of British Royal Corporal Charley Ward of British Royal Warfore won the title with a seventy two hole score of 198 Corporal Liboly Alangrum of Las Angeles and United States champoon in the Eastern theater massed his chance for the crown on the thrd round with a 79 for a total of 50.2.

Mrs Mildred (Babe) Didrikson Zaharias retained her western open title and was se lected as the outstanding woman athlete of the year

OELAROMA ACCIES RUN OFF WITH NATIONAL MONORS IN BASECTHALL COMPETITION

Basketball had another terrific year again establishing new attendance records. The Oklahoma A & M. quintet earned the national mythical championship honors by stopping DePaul University 52 to 44 in a

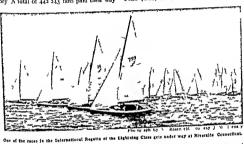
charity game in Madison Square Garden be fore more than 18 000 people The contest raised more than \$50 000 for the American Red Cross

Oklahoma qualified for the Red Cross game by winning the National Collegiate A.A crown beating New York University 49 to 45 in the final round And DePaul earned the Red Cross invitation by whack ing Bowling Green 7r to 34 in the final of the eighth annual national invitation tour ney A total of 442 243 fans paid their way

stopping the Washington championship Redskins in the final play-offs of ross

The year's college football was dominated as never before by one team-\rmy The greatest West Point eleven in history crushed all opponents in steam roller fashion as it marched to a record of eighteen consecutive triumphs made over a two year span

Colonel Earl (Red) Blanks of the led by one of the most explosive one to a punche in pigskin memory Glenn (Jun or) Di Felix (Doc) Blanchard blasted the r three



into Viad son Square Garden for twenty six double headers—a record total
The United States Military Academy

quintet beat the Naval Academy 50 to 48 closing its season with a record of fourteen victories against one defeat-this coming from the University of Pennsylvan a and breaking a twenty seven game winning streak which started three years ago. The University of Iowa won the Western Con ference championsh p And Vince Hanson of Washington State was the country's lead ing scorer with 592 points George Vilkan set an individual scoring record pouring fifty three points through the boop as his DePaul team beat Rhode Island State

In the first 1945 gridiron game the Green Bay I ackers defeated the College All Stars 19 to 7 in the twelfth annual All Star classic at Soldier Field Chicago before 92 733 pectators on August 31 The Packers earned the right to meet the former college stars by winning the vational Football League bg mals Notre Dame Pennsylvania and Navy by 48-0 61-0 and 32 13 counts

Across the country Indiana beat out Mich gan for the Western Conference title Alabama reigned supreme in the Southland and Oklahoma A & M was the class of the Southwest On the West Coast St Mary's was tops but in conference play the Univer sity of Southern California grabbed the crown and with it a bid to meet Alahama in the Rose Bowl The Sugar Bowl pitted St Mary 3 against Oklahoma A & VI the Cotton Bowl matched Missoury and the University of Texas the Oil Bowl featured Tulsa versus the University of Georgia and the Orange Bowl listed Holy Cross and the University of Mame

In the 1945 National Professional League play-off the youthful Cleveland Rams Western winners patted their Bob Water field Jun Benton pitch and-catch duo against the ageless Sammy Baugh and the Washington Redskins Eastern half titlists



Star Pilot with Jackey Eirhland ap was the fifty pixth running of the Feturity at Belmont Path

The Rams wen the championship 15 to 14 as Waterfield starred with two touchdown passes

The Montreal Canadiens and the Toronto Maple Levis charred h.keys a maje rh nors. The Canadiens finished on top on the final and the Maple I eafs won the cherobed Stanles (up play-offs turning back the Detroit Red Wings in a thrilling, seen gime series The Maple Levis won the first three bockey but the Red Wings came trait back won the next three and lived the series I as the seventh and final battle Toronto level out a 211 if decision before 13 850 first the Detroit hastory to watch a hexty game and Detroit hastory to watch a hexty game in

Flmer Lach of the Canadians was soted the Hart Trophy awarded annually to the National Hockey League plaser soted the most valuable to his team for the season

Alan Ford captain of Vale steam was the outstanding individual performer in sum ming A native of Balboa of the Canal Jone Ford was a Navy \ 12 trainee at \ale dur-ing the past year. He established himself as the country's current fastest free style aquatic sprinter by setting an assortment of records In his final appearance in a Vale swimming suit he bettered the world's 100 vard free style record in his college's twenty vard pool sizzling over the distance in 40.4 seconds The previous mark was 498 seconds onds made by the famed Johnny Weissmul ler in 1928 Ford also holds the international 100 yard mark for the standard twenty five yard pool of 49 7 seconds In a dual meet with the United States

Military Academy 1 ord won the 50 and

soonard free style events but the Cadels still nameged to wan the team honors 44 to \$1 The seitherk broke 1 ales satty-stredul next unman stream. Vincing rate won the natural V V U team crown with 26 points three mr. it has that scored by the Great Lakes Vaxal Training Station. The Univerted of Vincing with the 18 to 18

Crew nating again went through a cuttailed campaign with only Columbia Massa chasetts Incititize of Technology, Cornell and the Inited States Nat il Cademy end ing basts into the water Columbia claimed whit how is there were beating all except cornell.

THE POUGETEEPSIE REGATTA CREW RACING'S RIG LYEST WILL PROBABLY BE RESUMED

The annual Loughkeepsie Regatta which annually brought together college crews from cost to cost but which his been canceled since 1941 will probably be resumed on the Hudson River in 1946

Vaching also was conducted on a minor scale but such fittures as the Larchmoot Race Weel, and the Manhasel Bay Vacht (this fell race series were continued on Long Island Scund Cornelius Shelds probal to had the mist success with his Alternie won the Road Dermida Vacht Club trophy and the season's series in the International Club.

Son after V J day yachting oficials immediately announced that the sport will go I rick in a heavy schedule next year. The first international occurs going rare since the warbroke out in Furi pe the text across the Gulf Stream from Newport or New London to Bermuda has already been scheduled for June

SIR MAICOLM CAMPEELL WILL ATTEMPT TO SET A NEW MOTORBOAT SPEED RECORD

Votorboating has been at a complete standard vace the set started but the boats wall be back an apa6 Srr Valcolm Campbell the first man to attain a speed of 150 miles an boar in an automobile and who late rased the mark to 300 miles an hour is go mg to make an attempt to push has speed boat Bleebord II above the 150 miles an hour mark he announced in London Stortly direct between ended The Bluebord of it has been bying like in the garage throughout the color bying the in the garage throughout the

Horse racing came up with some brilliant

thoroughbreds Louis B Mayer's Busher a fifty was the outstanding three year-old of the eason Mrs Elizabeth Graham's Maine Chance Farm housted two great two year olds Beaugay a fifty and Eur Filot a coil. And Mrs Eithel D Jacobs Styme was the lastest among the older handring horees All of these thoroughbreds won at least \$4000 cool in purses during the season of the property of th

THE BIG THREE YEAR OLD RACES OF THE YEAR SEE THREE DIFFERENT WINNERS

F W Hooper's Hoop It won the Ken tucky Derby Classic at Churchill Downs Mrs P A B Widener's Polynesian captured the Preakness at Punitio and Walter M Jel fords Pavot came out on top in the Relmont Stakes at Belemont Park in the by three year old races Incidentially Pavot which the purentic champion of rajet was unable to win another race after his conquest in the Belmont Stake.

Titan Hanover a bay three-year-old son of Calumet Chuck and jouril, owned by E Roland Harriran and Major E G Gerry was king among the harness hores. He won the sport's most important event the Hambletonian in two straight heats at Coshen N Y I urchased for \$5,000 as a yearing Titan Hanover has already won more than \$50 000 in puress Titan was the first two year-old even to trot a mile in two munies flat and is unbeaten both as a two-year-old and as a three year-old

EXTERMINATOR ONE OF THE OREATEST RACE BORSES OF ALL TIME DIES AT THIRTY

Teterminator, regarded by many intrinee as the greates trace horse in a loave of ed loss. September 36 at the venerable are of thirty at the farm of its owner 4 fix. Will 3 Sharpe kalmer Known as. Old Bones. Extremina for competed in 100 races and won exactly, half of them. Among his conquests were the kentuck, perby Saratopa Copt three times the Pimli on Cup three times the Pimli on Cup three times the Pimli on Cup three times the Lationa. Townst and Actorium Gold Copts and Brooklyn Handicap.

Deraid Every of New York, continued.

Tolling up victories on the feneing strips. The veteran regained the national oil title an honor he held in 1938 and 1940. Thor? Vil las also of New York retained his national saber crown while Vlack Gilman a new comer from Ill nois, won the national spectory.

Joe I latal, first class seaman in the Navi regained his supremacy among the country's handball players He had held the national AAU four wall singles championship for eight consecutive years before Frank Coyle of the New York AC beat him in 1944 But Platak came back stronger than ever and beat this same Coyle in the 1945 final 21 10 21 8

Dog fancers as usual hid an emoyable year despite the fact that most shows were hinted because of transportation difficulties. We and Miss T. H. Snethen gained the most coveted bonor of the year when their Shelling Signature an unheralded Scottish Ter zer won Westmanter's best in show a vard at Madson Square Garden on February 13. This was the first time the bred won the title at this annual fixture in thirty five years.

With the war over the cognoscent in the field of sport predict that 1946 will see the return of compet tion on the pre war scale and that spectator interest in athletics will enjoy a terrific boom. The airplane is expected to play an important part in this new sports era. In ernational competition is sure to increase now that peace is here.



An night man thell an the Charles River at Beston.

STORE

OF YOUR OWN

By Wilford L White

Acting Chief Division of Small Business United States Department of Commerce



HAVE you ever thought that you would like to own a candy kitchen or a gro cery store or a hardware store with a display of shiny tools? Take for example a grocery store. The next time you go into one look about you There is a can of coffee It may bave come from South America probably Brazil Over there is a jar of olives possibly from Spain Look at that row of boxes con taining sp ces Some of them came from the West Indies Africa China India or Yugo slavia There is hardly a shelf which does not contain something which came from a foreign country It may be something cured under the tropical sun shipped part of the way on camel or donkey back and handled by men and women in foreign dress who speak foreign tongues

The storekeepe brings all these products together from all the ends of the earth. He purchases them in large quantities through importers and wholesalers and sells them in small amounts Because he sells in this way he is called a retailer. The verb to retail means to sell in small amounts.

About as long as you can remember you have known what a retail store is Such stores are everywhere in little communities as well as in hig cities. They range from huge department stores to very small shops.

organization of the control of the c

a great deal of money in buying the goods they wish to sell at a profit

Dad you ever stop to consider how important these retailers are and what they do for you and your friends? Just suppose that all the retailers are not have a supposed to the part of the supposed to the part of the suppose the supposed to the part of the suppose the supp

Retailets from whom you buy serve 35 your putchasing agents It is their business to have what you want when you want it in the right size style or color and to sell it oyou at a reasonable price. Storekeeping is a real job. It takes training and experience but it can be a lot of fun.

Because so many persons are interested there will probably be 500 000 new stores opened in the United States this year Now during the time those 500 00 new stores are opening up about 500 000 ofter stores will close their doors. That means that at the end of the year the total number of stores will be about the same as it was at the becausing.

Why do so many stores close? During the recent war, there were three main reasons (1) the storekeepers could not huy met chandise to sell (2) they could not hue new workers to take the place of those who left and (3) many storekeepers left to join the

armed forces During the war, hundreds of thousands of stores—most of which were small—were obliged to go out of business

But many stores, large and small, went out of business before the war-usually more than one thousand a day Why did these stores close? Well, most of them had failed to make a living for their owners Often the trouble was even worse. Many of the storekeepers had gone into debt and could not make enough money to pay their bills To owe money which you can not pay is a dis aster Such disasters happened to thousands of storekeepers, and it is important for you to understand why they happened Prima rily, the storekeeper was not well acquainted with all the problems of running a store. He lacked training and experience. He did not have enough money to begin with Some times he located his store where there were not enough customers to keep it going. Some times he sold too many things on credit and did not insist that his customers pay him when they agreed to do so There were other reasons, too, but the main one was that the owner did not know enough about running a store to make a success of it You ought

to keep that in mind

Vany people who have the ability to own
a store and run it successfully, never do so
simply because they have not studied such
a venture carefully. The first step in this
direction is to consider what type of store
you want to own You should open a store

which can offer for sale what people need and want and are willing to buy from you Remember you are to be the purchasing agent of the people who live near your store You must know what they want or your store too will disappear in a year or two and take all your prestiment with it

Here is a list of stores. It is not complete but it will suggest to you some of the oppor tunities there are for small storekeepers.

Some Popular Kinds of Small Stores

Boys Wear Shop Sessiand and Smake

Firmestore Shan

Boys Kear Shop
Drugstore
Drugstore
Drugstore
English Shop
Store
Food 'Gore
Hardware Store
Jewelry Store
Mens Wear Shop
Faunt Shop
Radio Shop
Bakery Shop
Bakery Shop
Book Store
Candy Store
Leather Goods Store
Leather Goods Store
Womens Apparel Shop
Womens Apparel Shop

Photography Shop Sandwich Shop Sports Goods Fore Sports Wear Shop Beauty Shop Blouse and S veater Shop Children a Wear Shop Gdf Shop Internor Decorat n Shop and Embroid ett Shop Millinery Store Misses Wear Shop

Stationery Store

This does not mean that all these different kinds of stores can be successful where you are located \(\frac{1}{2}\) ou might agree that you could not be successful in a town of about five



Rad o ood Televis on Retal ng

A radio and television repair shop s fore fine apportunities for the mechanically minded young man. Mont of these stores also sell accessories and



It is extremely important to; mean recast steps to be, done to the context of here. This rive of the male three of a small city of typical of small public decisions are made in the world. It suck a largetim he interests the becomes fix one electron state of the becomes fix one electron state of the becomes fix one electron state of the state

sixty cents a pound. Yet in the larger cities where there are more people to buy this candy, there are many such stores making a profit.

After you select the kind of store you

would like to have there are many other things which you must know Running a store profitably is not so easy as you may think. Here are some of the things you must do

I You must select a good location A re util store can not go to fix customers so the customers have to come to it. Many custom ers go to the store which is most consenent. That is particularly true of such stores as gocciese, battohat and drugstores. For other kinds of merchandisc however more hopes like to stop around. Examples are controlled to the store of the store of the stores the best location would usually a find to the store of the store of the store of the lar merchanduse. Selecting a good location is a very important matter.

2 You must prepare the store for business After the location has been selected, a great deal of attention needs to be given to the building and to its interior so that people will be attracted to it and encouraged to so inside. The character of the front win. dows and whit they contain will indicate the character of the store. Signs outside must be next and clean. The interior should be bright and shiming. The merchandise needs to be laid out curefully so that customers will know where to look for it with the least amount of trouble and delay. All of this lass to be done before the store can be opened for business.

3 Ion must lony your merchandute There is an adage which says Cooks well bought are half sold. Most small retailers do not buy direct from manufacturers. They buy most of their goods from neighboring whole salers manufacturers agents brokers or other types of middle-men Since a retailer must revel ling goods to a customer before he makes a profit he must really know what the customer needs and wants before buy what the said the said the said that can be bad can be bad.

4 You must sell the merchanduse which you buy You are familiar with the selling of all kinds of goods. Before you see it on the shelves, merchandise must be unpacked sorted priced and marked for sale. If you have a good memory, it will help you very much in waiting on your customers for you

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will know where each article is and can find it at once. If a customer asks you for some thing which you do not have in your store you will not have to waste time looking through your stock to see whether it is there or not You can say at once that you do not have it You should know enough about your merchandise to know whether or not you can obtain the article your customer wants If you know that you can get it and that it will be profitable for you to do so you should tell your customer that you will be glad to get it for him

Heaving your customer is one of the im portant points of selling Many successful retailers make a special study of selling Some courses in salesmanship are very helpful Whether or not you study such a course you should remember that a customer will come back to your store again and again if you have made him like you and trust you Otherwise he will do his best to buy what

he wants at some other store

If you have clerks to wait upon your cus tomers you will have to here and train them You will have to see that they are helpful to the customers You will be able to make your clerks into much better salesmen if you

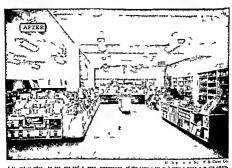
are a good salesman yourself In order to sell your merchandise you must find wave of bringing customers into your store In a ld tion to having a good focate it an attractive store and things for safe that people want you may wish to bring in more customers by letting them know what you have for sale Advertising will help you do this You may advertise in the newspaper or over the radio Handbills are another use ful way to advertise your store. You may write the handbills sourself and even distribute them yourself but you will have to and a printer to print them for you

5 Jou must make a trafit A retailer buys his moods at one price and sells them at an other and higher price. The difference between what he has paid for a prixluct and the price he gets for it is called a margin This margin is very important If it is too high the product will be too expensive an l nobody will buy it. If the storekeeper always tries to make as big a margin as he can peo ple will soon come to think of his store as very high priced and they may try to do their shopping elsewhere O i the other hand the storekeeper can not afford to have his margin too fow If he does he will soon go out of business. He must make sure that hi margin is large enough to pay the expenses of running his store fle has to pay the rent on his faull ling silaries to all who work f r borrowed money from the bank. The money which remains after all expenses have been paid is clear profit called net profit The storekeener may be able to keen this tiones for himself to pay he five g expenses and to use in any why he pleases. But the good re-



A DRUGSTORE IS GIVEN A NEW DRESS





~3°E~

tailer thinks twice before he fritters his prof

If he wants to build up his store he may put part of the profits back into the business He may use it to increase the size of his stock-that is he may buy a larger amount of merchandise so that he will have more to sell Or he may spend some of it on improv ing the appearance of his store perhaps buy ing a better display case or installing a bet ter kind of lighting. He may think of any number of ways of spending his profits to make changes in his store. In each case, he must consider the change very carefully to be sure that the expenditure will prove worth while This is especially true if he is thinking about spending his profits to enlarge his store If he is in too much of a hurry about making his store bigger and if he buys more stock than he can sell he will find himself in all sorts of difficulties. One word for this kind of trouble is overexpansion. In plain ordinary language, he has grown too big for hts boots

6 low must keep records Today the retailer must how how to keep hooks. He has to keep track of what he buys of what he sells and of what he over the sells and or what he over the sells on credit he must set up an account for every credit customer and send hum a monthly statement. He must keep a careful record of all income and expenses so that he can report on Social Security and make out his tax reports. Record keeping is very important. One of the chief reasons for busness failure is unwillingness or mability to keep an accurate record of all transactions every day, just as they happen.

7 You must keep a clean store A retailer should be a good housekeeper He must keep his store clean wasb the windows regularly sweep it every day have everything look iresh and new see that his clerks are neathly dressed and make the store so inviting that Pecole will want to come back

review and want to extra small one the proprietor may have to do a fit of these things himself. Then he will have to get to the store early in the morning and sweep out before he opens the store for business. He must talk to the wholesale salesmen and at the same time, make sales to his customers. At night after closing, he must check his stock and detaile what he needs to buy next make the proper criters in his record books write out and detaile what he needs to buy next make the proper criters in his record books write out in and decide what he is going to do tomor tow other than routine work. Only then can



Ew ng Gallows

These frawded windows and agly signs do nothing to make this men a wear store attractive Its only appeal lies to the promise of a possible bergala to be had.

he go home. He can not be a clock watcher. Now let us surmarize the opportunities and responsibilities the favorable ideas and the unfavorable ideas concerning your own small retail store. Here are some of the favorable points.

1 The business will be yours and you will be the top man or woman in it

be the top man or woman in it
2 If you have a new idea you can put it
to work right away and if it proves to be a

had one you can drop it just as quickly
3 You will manage your own time and
capital and any profits you make will be
yours to use as you see fit

4 In the early months of your store some of the members of your family may belp you so that you will not need to spend your in come in hiring help

5 As your business expands you will be come an important member of your community You will be able to help others less for tunate at the moment than yourself. A great deal of pride and self satisfaction can come from your own hard work and success.

But before you reach any conclusion please think about the points on the other side

I When you are boss and owner of a retail store you are responsible not only to yourself and your family, but to your employees, creditors and customers You are the nee who has to meet the payroll every Saturday and who has to find the interest for



Buyers for 6 see abops eften wisit wholesale booses to select their merchandles. Here we see two models displaying evenling gaves for the approval at buyers. In addition to scientific attractive styles. The buyer must check questry each you. And mo a tump seat, be must knew jost what type of drose his customers will want to boy

that loan at the bank every month

2 Every final decision is up to you No matter what the question is you will have to decide what to do in every instance scores of times a day

3 No retail store will run smoothly even after it has been open for a long tune. A hundred and one things come up tinexpectedly You must be able to adjust yourself and your business to constantly changing conditions because many of these problems will be outs de your own control

4. You will have to work hard probably harder than you have ever worked before For unstance in many cuttes retail grocers must be up and at the fresh produce market was the properties of the properties of the you feel the store must be open ast days a week from a certain hour to a certain hour Good customers may want you to get thougs for them after hours Saurdiay is often the busiest day and there are no vacational summer off to go to the shore or the moun tains or the lake or to take long trips

5 Even after your store has grown larger and you have several employees the chief responsibility is still yours day in and day out if you try to dodge the responsibility it will not be long before your creditors take your store away from you

If you still want to own and run a small store the next thing to do is check yourself and determine some of the things you need for success It will pay you well to develop those which you lack.

t What experience do you have? Boys have a greater opportunity to go n experience that gris have because they can deliver packages open hores shele atools and do many things about a store even before they can wait upon the customers But guils can ga n experience too as checkers in governy stores or as stynets and clerks in department, dry goods and other larger types of stores.

2 School work in arithmetic writing spelling and English grammar will give you important tools for running your store Typing manual training and public speaking will be a great help to you Every store owner should have some training in civics retaining and salesmashing Remember experience and training are important and there is no substitute for them

3 Do you like to be with people and work with people? If you would rather curl up in the corner with a book or go about exploring the out-of doors alone you should forget about running a retail store You will have to work with people every minute of the day

4 Are you willing to work hard long hours? Owning a business is really hard work and you must keep at it every business day of the year Every year This is a very im portant point

5 Do you have imagination and initial tive? It is not enough to have a lot of new ideas. Your ideas must be practical ones which will work and produce more profits for you. You will have to make your own decisions. You will have to plan ahead for your store not just wait until things happen and then decide what to do If you do not like to think things out for yourself and if you

are slow in reaching a decision do not plan to own a store

6 Do you save your money or spend it as fast as you get it? To run a store well you have to save so that you can buy more mer chandse in season or be ready for a bargain or give your store a fresh coat of paint when it needs it Xou must have money on hand when you want it or your competitors will take away your trade

7 Are you as good as your word? Of course you realize that you must be honest carried and ready to help others A reta let carries on much of his bissness by word of a standard of the bissness by word of a standard of the s

F lomena a Hobby Nu ley N J
The young lady who owns a gift
they has the jay at selling wates
that are murel and differentpottery hashers toys and hus
dreds at other bright and exciting
articles



the most important point of all is fiking to help other people. If he is selfish and always thinks of himself first, he is not going to be a cood retailer.

Now if you become a retailer a good one what rewards are there for you? There are a great many as any successful retailer will fill you You have the satisfaction of bring mg from the ends of the earth goods and services which the people in your community need and will use You help these people have a pleasanter happer life You help them any of them in their emergences You help them with their ptoliciens. In doing these things you will make many firends who know you rea a fine person and who value your friend

Second you will be a very important part of the world of business No manufacturer could keep his machines go ng a week were it not for the retail store which tells him what the customers want and which ees that the custom erage tri after it is manufactured Without the retailer business would jerk to a standstill Our whole way of living would

have to be made over

The disposition of the position of the positio

creative ability results in a sound profitable business. There is a healthy pride white gives a glow to everyday living in seeing one's hard work and effort bear fruit. Keep ing an attractive store sometimes brings out artistic talents the owner did not know he

had Fourth a successful retailer can do a great deal of good in his community by sup porting everything in it which will make that town a better place If you check the mem hership of the luncheon clubs the names on the boards of directors of the chamber of commerce the local hospital county fair churches and other community activities you will find the names of many retailers fice on the city council and school board Many storekeepers are able to give these community responsibilities the same honest hard working support that they have given to their own businesses. In doing so they aga a have the satisfaction of helping others without seeking any direct return

Finally a successful retailer receives a reward for his bloors in the form of the net profit which his store produces It will provide for his family and himself many of the things on the profit which has been been been as the profit which has been been been been as the profit of his children and enough money so that he can reture later on The rewards of a six of the profit of his children are the rewards of a six of the profit of th



Pub sher a Work estomers may browse at joinne is a friendly store to ewi

A comfo table and well decorated bookshop where can



Plants form the sun a energy into food, and then we eat the plants to give us energy for play and work

Our Debt to the SUN

By Morris Meister

SOME day there no longer will be any coat or oil for man to use, how soon can not be predicted exactly, there are differences of opinion among scientists. Yet that time will surely come—one thousand, ten thou-sand, or perhaps one hundred thousand years from now-if we continue using fuel at the present rate How, then will man do the world's work? Trains and steamships would stop, since they require coal or oil A great many of the machines operated by electricity would eease to turn because most electric generators are driven by engines re quiring steam or oil The few that are driven by water turbines would be hardly sufficient for modern purposes Electric cells and bat teries can not do the work. The automobile would be motionless. No airplane could leave the ground Many homes would be cold and most factories would be silent Of course, we should still have the wind and flowing water, such wood as could be had from forests and the fuel that can be manufactured from plants Yet modern civilization could not get along on these sources of power alone

Coal and oil are the retrains of certain Dains and tiny animals which lived millions of years ago. These ancient living things used sunshine, just as plants and animals do today. Each time we burn a lump of coal, and each time we "step on the gas" we are using up the energy of ancient sunshine. The axis is still shining and its energy is being some day from the coal and oil. But we may be supply the coal and oil. But we may be supply the sunshine, or olse we must find sources of energy that do not depend upon the sun Scientists are benot depend upon the sun Scientist are dependent and depend upon the su

ginning to make progress in both directions Let us consider first what might be done to barness the sun for doing some of the work of the world

Day after day, the sun pours out vast amounts of energy It is estimated that the earth is surface receives from the sun each year the equivalent of many thousand horse power for every square mile. If we could make good use of the energy absorbed by even adoem square mile the threat of a could the state of the could make good use of the energy absorbed by even adoem square mile the threat of a could the last one hundred years, the minds of many men have been busy trying to solve this problem.

In the year 1866 Emperor Napoleon III of France visited the shop of a French in ventor named August Mouchot In the yard of the shop stood a large, cone shaped object resembling a huge lampshade. The opening of the cone was directed toward the sun its inside was lined with a thin film of silver At the small end of the cone lay a small cop-per box, blackened on the inside. The Emperor was told that this curious device was a solar engine, that is, a sun engine. The rays of the sun were gathered by the cone and reflected by the silver lining down upon the small copper box which contained water The heaf caused the water to boil So im pressed was the Emperor that he urged his government to support and finance the building of many of these solar engines Yet, the scheme was not very successful

After Mouchot came several other inventors of sun engines All of them used one or more of three important arrangements for collecting the sun s rays—the coincil mirror, the cylindrical reflector, and the hot box an antight box, black inside, and covered with two layers of glass. Heat waves pass through glass, and black absorbs heat

A solar engine was set up in the Arizone desert in 1904. It used a cone shaped reflector and weighted about 8 300 posionds. Seven the set of sundained was considered which boiled water into steam which the set of the second of

One of the most workable solar engines ever built stands atop Mount Wilson to Cal ifornia It consists of a large cylindrical aluminum mirror that is free to rotate about an axis parallel to that of the earth's clock mechanism causes the mirror to follow the apparent motion of the sun. The rays of the sun are focused on three continuously connected oil filled glass tubes about six feet long Each of these tubes is covered with two other tubes which enclose a vacuum so that very little heat is lost by the oil As the oil gets warm it rises and soon a circulation is set up from the oil tubes to a storage tank and from the tank to the tubes As this continues in the sunshine the oil gets warmer and warmer sometimes reaching a tempera ture of about 300 degrees Fahrenheitwhich is hot enough to bake bread cook food or boil water into steam for power pur poses Seven hours of sunshine a day are enough to keep the machine going day and night at about 212° F Th's machine is sometimes called a sun cooker

There have been other efforts to make use of direct sanishine. One of the most interest use is to use the sun a heat to produce cold You are familiar with the type of kitchen re frigerator which is operated by a gas flame. The heat of this flame evaporates a special hund called a refrigerant. The evaporate dringerant (moy a gas) is the compressed When the gas is allowed to evapand again arpidly it produces a cooling effect which freezes the ice cubes and keeps the food confirmation of the confirmation

Another scheme for making direct use of the sun's energy is to allow it to heat the junction of two pieces of different metals If hen this is done an electric current begins to flow in the metals. The current though small in amount can ring a bell light a lamp or run a motor The metal junctions are called thermocouples. Some years ago a German scientist by using several thermo couples succeeded in keeping an electric lamp lit by sunshine for several months A French scientist has proposed a plan for con necting together half a million thermocou ples The junctions would all be exposed to the sun and the ends would be embedded in concrete so as to keep them at a lower tem perature in this way huge amounts of elec tricity would be obtained Unfortunately the cost of building the arrangement would be too great as long as there is still enough cheap coal and oil available for generating all the electricity we need



The most likely use of direct sun shine in the future is the opening up of desert areas These regions have steady sunshine and they are usually far from coal and oil If the sun's energy can be by some caught form of solar engine it can be changed either into the heat energy of steam or into electrical en

ergy With energy available man, such descrits can be irrigated and transformed into fertile farms and gardens Excess electrical energy can be sent out to other regions which do not enjoy such intense and steady sunshine

We spoke of finding sources of energy that do not depend on the sun Men have dreamed for years of using the power of the tides and successful experiments have been made The greatest field for power research today is within the atom. Ceaseless activity goes on inside the atom and an enormous amount of energy is occasionally developed accidentally when atomic particles collide Some atoms as you know are breaking up and giving off (radiating) energy Radium is one of these elements whose atoms are breaking up Other atoms can be made to break up We call the process atom smash ing For some years atom smashing has been going on in laboratories all over the world but until 1945 was a way found to employ the energy thus created (See Atoms and ttom Power) The use for atom power so far has been for destruction. When we can learn how to harness the enormous energy that is now locked within the atom we shall have all the heat and mechanical power all the electric power and light that we need But even then we shall be dependent upon the sun for other things

THE ENORMOUS HEAT OF THE SUN OUR SOURCE OF ENERGY

The sun is a tar tome 91 200 coo on mole away it consists of many different byers of Rues at a very high temperature. The temperature of the surface of the sun is estimated at about 11 coo degrees l'abrendent This is twice as hot as anything mun his been alle to devise. The wins interior may be ten times hotter. At these temperatures the molecules in matter break d win into the smaller particles called atoms. The atoms while particles called atoms. The atoms of lightly with the sundergo change sembing out 1735 of lightly and the sundergo change sembing out 1735 of lightly and the sundergo change sembing out 1735 of lightly and the sundergo change sembing out 1735 of lightly and 1735 of lightly and

The sun is the basis of our ext tence and the source of all our usable energy. There are several forms of energy labt hert me chancal electrical and chemical Each form can be changed into another. The starting can be changed into most of these changes however is the left energy, which p urs down from the un I was have probable tired to concentrate the light rays of the sun with a magnifus probable to the light rays of the sun with a magnifus probable.

gluss or a murry. The light changes into beat which can both water mu steam. The steam can turn a small dynamo. Thus the beat energy is changed into mechanical energy. The dynamo generates electricity showing how mechanical energy. Electricity can decompose water into hoften and ovygen. This is a change from electrical to gen a first of the state of matter all means for carrying on the activities come to us from the sun.

HOW MAN USES HEAT ENERGY TO GET ELECTRICAL ENERGY

The rays of the sun cauve the water of lakes rivers and oceans to exported into the air Later the air mosture condenses and falls as rain snow or hail. This fills the rivers which can be dammed so as to store water at a height. When allowed to fall and press against the hiddes of a turbine or water wheel the mechanical energy is changed to feletrical energy.

The sun warms the land and the water but water heats up more slowly than land and then holds the heat for a longer time the art over it rees letting in the cooler was breeze. When the sea is warmer (during the might) the arr over it rees letting the cooler to the cooler was the sea in the cooler was

land air blow toward the sea

You know that the earth is tilted with respect to its path around the sun You know that because of this bil certain regions of the earth receive the direct and concentrated rays, that he changes and operated thinly over the earth received and the changes and operate thinly over the area. The summer essaon comes to three parts of the earth which are bathed by direct sumshine, and the winter season arrives where a section of the earth received the rays slattices. Regions are the earth a Figuriary slattices are the section of the earth received the rays slattices. The part is not the earth a Figuriary that the part is the part of the part of the rays and the winter teaches a received along the entire typ. Hence such regions employ to summer reseather all the time.

Areas near the Poles never receive direct rays and have periods when they receive no sunshine. So polar regions are always cold

The fact that certain areas are always warm and others always off sets up huge movements of the air. We the earth span these air movements are crused to swerve and gue rise to the well known until left. It is in these moving air masses that wrather conditions start. In a sense them the sun is responsible for our weather. It is the suns energy which heats the land herits the air.



Wateriet brud et geret entra-tue werp pone

and causes the art to use and which evapor rates the water into the air Even the electic storms are due to the sun because evaporation produces electrical charges in the most ture particles and some of the sun's rays help to increase these charges. We owe to the sun our seasons, our climate and our weather

Light can stimulate the retina of the eye The eye lens forms an image on the retina and the brain interprets the stimulus as the picture which we see Certain chemicals are also affected by light A piece of photographic film contains small grains of a chem ical called silver bromide. This silver bro mide is colorless and onague. (Light can not pass through it) When light strikes the film the molecules of silver bromide are changed so as to leave a black silver deposit. This is what happens when a camera lens forms an tmage on the film Even when you take a snapshot, the momentary flash of light pro duces an effect on the silver bromide The effect is later continued when the film is de veloped and the picture printed from the negative

Contained in swilght is a kind of ray called alternated This ultravoled light is colorless and invisible to our eyes yet makes its precent known and fell. It is very reported that the property of the proper

mug is quite interesting. The action of sun bight on the skin or of the uttervolet rays contained in sunlight, is to produce a substance called vitamin D on the surface of the skin. The same vitamin D can be produced in foods such as milk or olds and fast by exposing them to ultravolet light, but vitamin D is necessary if our bones are to grow strong and it is most important to general good health.

It has been shown that ordinary window glass allows most of the sun's light to pass but blocks the rays of ultrasudet. That is why we are warmed but not burned by the sun in a glassed in port of roun room. There are special types of glass which permit the passage of the ultraviolet rays. There is room for much further study and improvement in this field.

Every leaf, every blade of grass enjoys a secret which the wisest scientist does not know For years scientists bave been trying to find out how plants make use of aunshine We know that water and minerals come up from the soil through the roots and stem of plants to the leaves We know, too, that there are millions of openings on the under surfaces of leaves which let in air containing carbon dioxide Then in the presence of a green material called chlorophyl and while the sun sends down its rays, a chemical ac tion takes place in the cells of the leaves As a result of this action, carbohydrates are formed and on gen is released to the air Carbohydrates-starches and sugars are ex amples of carbobydrates—are the food which the plant makes for its own use Then we cat the plants Thus corn, wheat, fruits and vegetables are the products which plants manufacture with the help of sunshine They are the food for all animal life, including man. Yet we do not know all we should like to know about the chemical process in the leaf which means so much to our lives

A GREAT RIDDLE STILL TO BE SOLVED-THE SECRET OF PROTOSYNTHESIS

Who will solve this mystery and learn the secret of photo-ynthreit, as the chemical process is called? The scientist who succeeds will releve the farmer of many beavy tasks and uncertainties. He will abolish forever the lear of exhausting the supply of coal and oil He will have found a way of duplicating nature's own solar engine—the leaf

It is estimated that one hour of sunshine falling upon a square yard of leaf surface results in the manufacture of about one gram

of carbohydrates. No wonder each plant al ways turns its leaves so that they ratch as much direct sunshine as possible! In an acre of plants there are about two acres of leaf suriace. During a summers growth a wheat field may take from the air about eleven tons of carbon dioude and with the help of sun energy it will manufacture about seven tons of wheat

Several scientists have already heen able to duplicate the process of photosynthesis on a small scale in the laboratory It is as vet too costly for large scale manufacture Many are studying the substance chloro ply liwhose presence is essential to the process? In the Boyce Thompson Laboratory for Plant Research, at Yonkers New York when you will be substance the Manufacture of the Manufactu

Marine plant life is also affected by the light and heat of the sun In the oceans there exist a kind of one celled plant called the diatom. Dustoms are bactern a of a sort which with the help of sunshine can produce the starch needed for their growth small marine animals feed on the diatoms Larger [sh feed on the smaller ones and so on Thus the sun manitans he in the

OCES DE

oceans. The heat of the sun also affects all animal ide. In the winter time in the Northern Hemisphere the suns relosest to the earth Homesphere the suns rays at this time reach us slaintwise and not perpendicularly liftle heat can be gathered. This absence of heat and the decrease in amount of sunlightly (since the days are short) causes many animals to hibernate that is to go mite a sleepy state for the winter. Snakes hazards (rogs, most wild began and sand grant and snakes) amost wild bears and snakes shareds.

out occasionally, for food it is likely that many animals would scarcely be seen during the winter months. As the earth revolves about the sun and spring arrives the animals come out of their partial sleep. They become active. Excrywhere on the earth animals tend to follow the sun. This is not just accidental. It is necessary for the preservation of their like.

It is sometimes asked how long life could exist without the sun Would life suddenly cease or would there be a gradual decay? As you know in the far north there is an almost total lack of sunlight for about symonths. Does life cease during that time to be resived with the coming of the sun? You enough energy is stored away during the dark period to maintain the necessities of life. Alminals hibernate and become dominant Wan needs most than just food and shelter He can not afford to hibernate 1 ife must go on.

Should the sun fail to make an appearance for a single year the result would be ruinous Plant life as we know it would vanish and animal life would soon follow

Is there a substitute for the sun? Can an artificial sun be created? The nearest thing to an artificial sun is artificial ultravolet light. However it requires electricity to operate the mercury vapor lamps and electricity is dependent upon the sun.

Our debt to the sun is one that can not be repaid. Ill our lives we are indebted to the sun for food, clothing and shelter. There is only one thing we can do to repay in part this great debt. We can practice contents from This means saving and not wasting. It is true that the sun is energy is apparently endless yet we must learn to take all we need and yet leave some for succeeding generations. In this sense conservation means careful and purposeful use. Only in this way can we repay partially our debt to the sun.



How wen and water produce power The san draws water waper up from the river to form to clouds. Childed in busing new mountains, the water waper condensed and fells on rate jates the restreet. Water follow from the days target mountains.

HIGH SCHOOL

TEACHING

AS A CAREER

By Lloyd Shaw Superintendent Chevenne Mountain Schools

WHE∖ I was a very young teacher I knew a great high school teacher of Latin and Greek I visited his home one day and there I found to my astonishment that most of the books in his library were in still another foreign lan guage When I exclaimed he told me

something which I have never forgotien The trouble with me he said is that I love everything When I see a miller at work I want to be a miller And when I see a stonemason I want to know how to cut and

lay a beautiful wall

And that is why he was a great teacher Like this wise man you must always have many interests that you enjoy sharing with young people Never lose your enthusiasm for it will help you to make your classes worth while and a great deal of fun besides

The good high school teacher likes to play with ideas and to talk them over with his pupils. This sharing of ideas is one of the greatest joys of teaching. There is all the wonder of science all the new discoveries that are constantly being made. And there is government! These are days brimlul of drama To become aware of the meaning behind the drama to share the awareness with those to whom it will mean most-that is a thrilling experience. In I terature and the arts there hes another vast world of sileas When you try to explain them to your mi pils you will have the creative joy of playing with great ideas in words of your own

Good times out-of-doors can have a great deal to do with teaching high school For in stance do you like to go camping? Mmost every boy and girl enjoys the stream the campfire and the open sky Or fishing? That is a splendid sport What marked us things there are to do! Hiking and swimming and



h l p Gendresu Alert tooking students like these make teaching a joy

horseback riding skiing and skating and other winter sports You need not give up any of these good times if you teach high school boys and girls This is a point I want you to understand The good high school teacher shares as many activities as he can with his pupils

Teaching high school is a dull business if all you do is lay out a few pages of dry text to grind through each day You will have a weary time if you try to make each year's work exactly like that of the year before if you allow your subject matter to become old and set your students will have no zest for learning and you will fail

But the more you enjoy your life as a teacher the easier it will be for you to keep your courses Iresh and new and vital

Sharing your ideas and good times with your pupils is fun of course but it is also very important for it will help you to under stand the boys and girls whom you are teaching When you know what interests them you will be able to arouse their en thusiasm as naturally as you breathe A high school teacher is off to a good start

II high school is the one kind of school where he wants most of all to be It may be the right place for you if you like one of your studies better than any other Suppose you like English so much that you would be per fectly happy teaching nothing but English Il you would rather teach Figh h than any other subject high school will give you the opportunity you want, for in most high schools the teacher is a specialist Nou may be a mathematics teacher, for instance Or you may like science best Many high schools offer you the chance to specialize in your ladvrite branch of science so that you may be a chemistry teacher or a physics teacher If history appeals most to you, you can even choose the period you prefer and teach noth choose the period you prefer and teach noth the control of the period you will be a change of the period you have you will be not offer you the same opportunity to teach only one subject.

You should also think about the ages of the boys and girls whom you are planning to teach You will fit into high school teach You will fit into high school students. Before you come to a decision it will pay you to consider carefully all the grades and all the ages covering school children s range. Which ages would you hike best

to teach?

Some teachers mostly women, prefer the youngest pupils—the primary grades or kin dergarten. Others—and this includes some men—prefer the upper grades. Many prefer the jumor high school with its attempts at being grown up. Some like high school best

of all, and I am one of these
At first I thought I would rather teach in
a college To work with young college men
and women would be a great satisfaction I
was tempted, too by the greater dignity that
seems to go with college teaching. Here I
had a little problem in what dignity really
is That is one kind of problem which you
will have to decide for yourcelf some day
will have to decide for yourcelf some day

But I should like to tell you what I thought about it Dignity, I concluded should depend on how well you do your job and not on what job you do

Collège students are young adults and than high school boys and grifs Now high school students are very young But ther abahites and skills are approaching those of growings and they are old enough to share much of their lives with you! I knew that! yould enjoy working with these young people most of all and so I chose high school.

I have loved it A high school teacher, if he

will can have a perfectly glorious life What kind of person should you be to make a success of high-school teaching? You will need good health and a sound strong body You will need a good mind and fine character-honest unselfish and well bal anced II you are ambitious and wish to ad sance rapidly to one of the best teaching tobs you will need to acquire certain out standing traits. One of the most important of these is enthusiasm which we have already discussed Another is the habit of looking as well as possible Your pupils will admire you more if you do and so will your fellow teachers You must learn to be fair in every situation that comes up and never to favor one student above another You should be a good leader and a good friend as well It will be a great help to you too if you learn to speak well in public And you must not be afraid of the hard work you will have to do, for it will not seem like work if you learn to en oy it



Round the table discussion in an administration course Learning to be a leacher is a lively enterprise



From All the Ch ideen Learning Speciels the modern way by reading a newspaper published in that leaguage

What education will you need to be a good high school teacher? Well the best start that you can make is to be a good student now that else? You must plan to have two kinds of education—general and special

A general education includes college all four years of it at the least In accredited high schools a bachelors degree in a stand and requirement for teaching academic subjects—that is such subjects as chemistry High schools in some states require an action to the school in some states require an action with the properties of the such as the states and the such as t

talten enough work, for your masters degree Vour special education will include two image—the subject which you are going to teach and also how to teach it. You will have to take some courses in the hutory of teach ing. Then you should study, the best teach ing methods that you can find. One of the things that you will study is the testing and measuring of studients and their curricular hat you can find their curricular hat is, the course which pure teaching a little with special practice classes. It is were inspection that you study teach ag where there are good facilities for you to teach studients for bein your first work with



Cou esy R verdale Country School A visit to the Museum of Science and Industry by a class in science





thildren will take place under the gu dance of experts That is the best way for a beg nner to learn to teach

It would not be a good idea for me to talk to you about methods of teach ng for many of these methods may have changed by the time you are ready to use them A great deal of experimenting is going on today in an at tempt to find better methods Right now there are more ideas on this subject than you can shake a stick at During the war all sorts of ways were used to teach the armed forces in a hurry and some of these new ways worked wonders Some to be sure did not Schools and teachers and teachers of teachers find all these new methods very ex

citing They are bound to be of great help to you when you study this subject

Where will you go to learn how to teach? Teachers college? Normal school? Or a spe cual department of education in a college or university? The best advice I can give you is make every effort to p ck the one that is best for you Your teachers will be glad to help you choose it and so will the principal of your school You will probably send for many catalogs and read them too before making your choice Remember that the chief thing you are after is to get the neces sary tools for your job and you can not be a good workman without good tools you will also have to prepare yourself for

the subject you want to teach Suppose you plan to teach chemistry. Then you will have to learn a great deal about the field of chemistry and also about all the other fields of science that are related to it.

All of these studes are a part of your specal education. Your general education will cover a great deal more ground. Do you know who. Well ming ne that you are about first day as a teacher. The time has come for you to tell your pupils a little something about the subject. Wouldn't it be just too but if you couldn't not pupils yourself grain matically and forcefully? And if you knew routing about the bastry of the world, you could not possibly religiously and the could not possibly religiously and the could not possibly religiously and the defently ground of chemistry flu into that won defertal story.

Do you think your puisls will respect you if you know nothing about great books and great art and great muse? I am afraid they will not They will be studying about these things at the same time that they are study ing chemistry and they will expect you to know something about them Another thing that a good general education should teach that a good general education should teach will be very valuable to you but his will be very valuable to you but his the classroom and out of it.

"What a pob to learn all that you will as you kiy our must not think of it as a pob it is furn! And if I study a butle of every hand." It is furn a make me a furn a furn

A TEACHER WITH A BOBBY IS A BETTER TEACHER

Things you learn outside of classes can make you a better teacher If you are mal, mg airplane models you need not feel adhanded of yourself for wasting your time. You can have all the hobbies you want. And you have all the hobbies you want and you a better teacher. It would be a good done to the property of the prope

Learn to play a musical instrument and work until you can paint a good picture and you will have opened wide the doors into two very wonderful fields Act in plays and write them. Travel the whole world over Perhaps you can not do all of these things but every one of them that you do will make you a better teacher.

HOW MUCH MONEY MAY THE HIGH SCHOOL TEACHER EXPECT?

Now what will you he paid for all this preparation if you do become a good teach et? In some parts of the country only \$100 to \$150 a month A good mechanic can make more. In other parts of the country and in the best schools you may make up to \$500 or \$400 a month but such jobs are not abundant.

However people are beginning to realize the need for good high school teachers and so I think that the pay is soon going to be better. Better teachers will surely get better pay I believe that high school teachers will soon ment the respect that used to be given only to college faculties in days gone by.

The high school has and will keep on having the fun of general elucation and of general knowledge. The high school teacher will have to become a wiser and wiser man or woman without ever losing the joy and en thussasm of youth. He will live a full and rounded life in an age that is becoming daily more limited and specialized.

One of our youing novelists once wrote When I sook by myring the high school lost a mighty fine teacher. That youing novelist has never written anything ever Jamous sance I always wondered why he did not stay in high school and write his novels in his vacation periods. Why didn't he keep his life full of the pay and adventure of youth! I think he could still be writing a fine novel every year or two if he had.

For I don't know of a richer life if one cares to make it so than the life of a good high school teacher. Not in money no But even there if the does a good job he will have little reason to complian People will ask him to do things outside of his regular school work and pay him well. They will offer him more special prizes than be can accept. And he can use his summers to increase his in come in any way he likes.

It was a high school teacher who with his own enthusiasm and on his own two feet worked out the jungle route through Central America. Hat the All America Hahan now follows while some of his teacher frends may have stayed at home all summer long. We each order our own adventure according to our dream.



SCANNING THE

TELEVISION HORIZON

By Peter C Goldmark

Columbia Broadcasting System

MORE has been discovered in the last four years that can now be apple to the improvement of television than would ordinarily have been ach eved in ten or fit teen years of peacetime development. This speedy progress of course was the result of having so many sentiests and technicians at work together on the common job of win ming the war. Under normal conditions these each bound to a certain extent by the amount of money he was permitted to spead on research.

"The standard televation picture before the war war made up of 323 bortsontal lanes that filled the screen from top to bottom. These lines varying in light and shade were fine enough and close enough together to produce a reasonably clear picture. Never theless they could be seen as lines much more easily than you can see the tmy dots that make up the pictures in this book. The standard televis on screen was a little large.



sove—An interested group enjoys a totecast on a une votelver Below—Part of the above receiver in I away to show the intricate wiring

than this page turned sidewise. It was not large enough to be seen comfortably by more than one or two people at a time Larger screens meant more space between the I nes

and the result of that was blurred pictures. In the near future we shall have television pictures that are made up of approvimately roop lines. That means that the pictures will contain about twice as much de-

tail of light and shade as the pictures we had before the war. The lines will be so fine and drawn so closely together that your eye won t be able to detect them. Morrower it will be possible to enlarge these pictures to at least eighteen inches in height before the lines become as widely separated as they

megacycles If these changes had come about under normal peacetime conditions they might have caused a great deal of trouble, for the sets and transmitters that were used in pre-war television can not receive or send the new pictures. Luckly from that point of view, the war put a stop to the manufac



Right. A televicion studio has many lighte They are edjustshie to give perfect illumination for programs



Lost—A television camera le fociased on the program. At least two of these mayable comeratare in action during all telecasting.

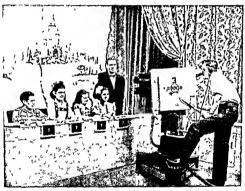
tures, in short, will be as high in technical quality as the best home movies To get these twice as good pictures, tele-

To get these twice as good pictures, television has had to 'move upstairs' in the radio spectrum, into the ultra high frequencies. It has also had to increase its band widths of transmission from six to sixteen rune and sale of all cevinan relevant replirment As a result, only nine transmitters and fewer than 7,000 rapidly aging sets are being made obsolete through the discoveries of wartime electronic research

Television in full and natural color is also possible in the ultra high frequencies and wide bands of transmission, and will be demonstrated at the same time as the improved black, and white pictures. Color televasion, contrary to popular belief, is not new It was successfully demonstrated by the Columba Broadcasting System more than five years ago. Among the relatively few people who saw them, a majority thought that the color pictures were superior to the black and white pictures of that time. The new color pictures where superior or to the best technicolor or color ullustrations in books, and magazines.

So far television has been seen in and around only a few scattered cities—New York Chicago, Los Angeles Philadelphia and Schenectady Television signals unlike ten years, as many people in the United States will be able to see television programs as can bear radio today

We do not yet know the exact method by wheb television networks will grow Two possibilities have already been tested and have proved practical One is to cannect tele vision stations to each other by special cable called coavail cable, just as radio stations are tied together by telephone wire Coaxail cable however is very evenisive. The thou sands of miles of it which would be needed for a nation wide network would cost many offer a nation wide network would cost many except the control of the co



A typical studie television scene le canght ne the camera focuses for a close-up of the "Teletruth" kid experts.

tado, travel only as far from the transmitter as the horizon That is why the few transmitters now in operation as localed as high mitters and the properties of the second serve-on top of atyscrapers in New York, on mountain tops near Schenectady and to Sangeles Eventually, of course, we shall have television networks. Almost scripainly within such station, for example has been built between Schenectarly and New York and an other between New York and Washington Through these two relay points program originating in one city can be picked up and broadcast to tweens in all three citles Coast to coast relaying however, would reourn nextly too such station. A third and most promising possibility was recently announced by the Westing house Electric Corporation This is to install televis on transmitters in specially designed airplanes that will serve as relay stations.

To understand what this new plan is all about you might timk of a ball being about you might timk of a ball being thrown down a long line of people. The first man in I net toses the ball. The next man calches it and throws it along. The idea is simply to receive it and send it on That is just what these special planes will do with televis on programs. Enough of these planes flying many m less apart could send a television program from coast to coast.

Suppose a program is taking place in a television studio How does this program reach the first of the special planes? The program is fed into a small transmitter program is the first planes. The broadcast—or you might say televast if you the that word better. The program is then picked up by a ground his receiver in the plane. Then it is del not the planes broad plane. Then it is del not the plane is ceiver in the next plane will pek up the program and pass it along in the same manner.

The plan is to have these airplanes fly in continuous relays at 3000 of feet over the areas they serve From high alituides of course the horizon is greatly extended and a mighe transmitter could cover approximately 10000 os square miles An airplane flying at 30 000 feet over Pittsburgh for example could cover an area extend in from Columbus, Ohio to Washington D C Ths startowision method has yet to be tested.



engineer and his sound-control rest



Lesding dim into the projection comera for a refulscate over Station WEDT New York.

an practice and to be approved by govern ment authorities

International televasion is still a long way ahead I to probably will not be with as until after me have built a nation wide network and milliona of us have televasion receiver in our homes. However there is no doubt at televasion programs can be sent from nation to nation and across occass. There was the televasion originated and the sent televasion originated and the sent from the control of the sent from the se

Television programs will soon be better than they have ever been Cameramen will not be as dependent on lighting conditions as they were before the war New Park of Corporation of America that are extremely sensitive to ord ranging the three tibes and the new high frequency standards of transmiss on television can be used for our door events in any land off weather of the condition of the three tibes and the new high frequency standards of transmiss on television can be used for our door events in any land of weather the condition of the standards of the condition of the standards of the standard

Some day regardless of where we live we shall be able to see in our homes most of the bg news events that occur in this country and many that take place abroad We shall

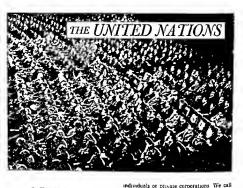


A Brooklyn Dodger basebolt game is shown before the cameros in a telerast from Ebbets Field Brooklyn New York.

be able to follow national political cam paigns from nominations to inaugurations We shall be drawn closer to our own law makers and to the foremost men and women of other countries

The possibilities of television in education are very great. In training millions of young men for various duties in the armed forces educators and psychologists learned a great deal about visual education. Much of what they learned can be applied through television in our schools and colleges. Much of what students now read in textbooks or hear in lectures can soon be seen in the classroom by means of television. An art class in Ne. braska or Alberta for example will be able to see great paintings in their true colors whether they hang in Washington's Na tional Gallery or in New York's Metropoli tan Museum or in The Art Gallery of Can ada m Toronto Medical students will be able to watch a master surgeon operating in a hospital many nules away Small high schools will have famous college professors and scentusts on their television faculties. It is generally assumed that television like radio will be widely used in advertising in the United States Broadcasters alone could not support the tremendous cost of network maintenance and programs 'ter' little television advertising has yet been seen to be an order of the state of

Before the war television pictures and programs were not good enough to interest many peoule But now television will make a fresh start based on the improvements it has inherited from warlime research It is boped that television will soon move for ward to become a major American industry one that will engage the working hours of thousands and enrich the lessure hours of multions.



By Vera Micheles Dean Foreign Policy Association

RARLA in World War II, the nations that were ranged against the Axis became known as the United Nations As the war spread, more and more nations jouned their ranks until, when the war ended with the unconditional surrender of Japan, the number of the United Nations had reached a total of more than fifty.

All continents, all climates and all races of mankind are found among the United Nations: Their people live in places as unable as you can imagene, from the jungles of Africa to the great cities of western Europe and North America Some have great wealth and some are as poor as they can be These many millions of people make their living in all kinds of different ways

There is the same wide variety in their religious beliefs and in their ideas of government. The United Nations include democracies and dictatorships, monarchies and republics. There are states—such as ours where the railroads and telephone lines and banks and mines are owned and managed by this system free enterprise In other states among the United Nations, the governments own and manage the banks and mines and railroads, and so on We call this system socialism.

But all these many nations, so different from one another, had one compelling aim in common. They were grimly determined to survive by defeating the efforts of Germans and Japan to enslave them.

As long as they were faced with the pressing danger of defeat, the United Nations spared no effort to help each other against a common foe. Britain and the United States supplied naval power and so, to a lesser degree, did other countries—notably Noway and the Netherlands Britain and the United States furnished most of the are power Russia and the United States, with their great populations, gave the bulk of the land armes.

The United States, because of its enor mous mularisal resources, was the arsenal of the United Nations It furnished a tremen does flood of munitions, guns, tanks, air planes and other war equipment. Britain and Canada, too," made war equipment for the United Nations Britain and Australia served as bases from which the campaigns were

launched that ended in the defeat of Germany and Japan Belgium, France, the Netherlands and Britain placed the raw ma terials of their colonies at the disposal of the United Nations Other vital raw materials were furnished by countries of Latin America Tin, for instance, was lurnished by Bo livia, rubber, by Brazil Resistance groups in all European countries aided the common cause Such groups, because they worked in secret, were known as the Underground The brave men, women and children of the Underground prevented Hitler from establish ing complete control over the Continent, and beloed to prepare the way for Albed invasion In the Philippines, guerrillas, hidden from the Japanese, snatched at every chance to kill or sabotage the enemy Soldiers, sailors and airmen of the United Nations fought bravely side by side, some in the steaming jungles of Burma and on the Pacific Isles, some in the deserts of Africa and others in the hedgerows of Normandy On all the seven seas as well as in the air above all theaters of war, they proved their courage and their comradeship

FACED WITH THE DANGER OF DESTRUCTION MANY NATIONS FOUGHT AS ONE

In this common struggle the interests of the United Nations became closely inter-woven People in danger of destruction have well been as the common destruction of a American leader, General Essenbower Similarly, Americans, British, Chinec, Indians and others fought as one great force in southeast has a under the competition of the common destruction of t

The United Nations pooled their resources of raw materials, food, manufactured goods and ships, and distributed these where they were most urgently needed. This was an enormous task. It was carried out through the Combined Boards in Washington, of which, the United States and Washington, of which, the United States and Washington.

Another tremendous tack was that of working out together the strawgs plan of the war. This was done through the Combined Chiels of Staff of the United States and Intain, who worked closely with the military leaders of the other United Nations Sigh nemarkable team work, no so buge a stafe, had never before been known. Aut one of the United Nations could have won the max alone. It was

team work that made it possible for them to

deleat Germany and Japan We all know, however, that military vic tory as not enough. If the partnership built up b, the United Autons in wastime should fall apart, the Germans and Japanese might recover their strength at some future dale. They might once more catch us off guard if we and out allies are no longer united. How we and out allies are no longer united How the wear of the strength and the strength of the strength of

COULD THESE NATIONS WORK TOGETHER IN PEACE AS IN WAR?

This question was being audied by President Roose-let and Prime Hunster Churchill long before the war was over 1n order to find an answer to the question they, and other Allied leaders decided to create a number of international agencies in which the United Nations would begin to prepare for the enormous problems of posce in the grim years a Year Sictory seemed still tragerilly detaint, the United Nations held a series of conferences. I have their business for conference in the grim and the problems of possible and the problems of the desired the series of the series of

The Food Conference at Hot Springs Virginia, established the Food and Agriculture

Organization in 1943

The United Nations Rehef and Rehabilitation Conference at Atlantic City, New Jersey, set up the United Nations Relief and Rehabilitation Administration in 1943.

An Albed conference on education was

held in London in April 1944

The Monetary and Financial Conference at Bretton Woods, New Hampshire, Inid plans for an International Monetary I and and an International Bank in July, 1944 A civil assistion conference in Chicago es-

tablished an international civil aviation board

m November December, 1944

All these agencies de-fit with special, technical questions, and could not be expected by themselves to insure co-operation among the United Nations over 1 long period of time it was plann that, such special special special organization that could offer a measure of ministry security and economic stability to all rations, county and economic stability to all rations, the could offer a measure of ministry security and economic stability to all rations, that the county and economic stability to all rations, the county and economic stability to all rations at the county of the county of

near Washington, D. C., 4 7, 1944, seq recentatives

THE UNITED NATIONS

Representatives of the following nations signed the Charter of the United Nations Organization in San Francisco U S A June 26 1945

THE BIG PIVE China Union of Soviet Socialist

Republica United Kingdom United States of America France

Argentina Austratia Belgium Botivia Bravil Byetorussian Soviet So-

Colombia Coata Rica

ctatist Republic (White Russia) Canada Chile

Czechosłovakia Denmark Dominican Republic Ecuador Egypt F.i Salvador Ethiopia Greece Guatemala Maiti

Coba

Hondoesa India Īran

Lehimon Liberia Luxembure Mexico

Iraq

Potand * Saudi Arabta Sycta Turkey

Ukrasnian Soviet Sociat ist Republic Union of South Africa Uruguay Venezueia

Netherlanda

Nicaragua

Norway

Panama

Paraguay

New Zealand

Yugoslavia

Philippine Common

wealth

* Poland aigned the Charter on October 15 1945

the United States Britain Russla and China-drew up proposals for a United \a tions organization

An important gap left in the Dumbarton Oaks proposals concerned the way in which the Security Council of this organization would vote This gap was filled in at the Valta Conference February 4 12 1945 At Valta in the Crimea were President Roose velt I rime Minister Churchill and Marshall Stalin Shortly after this meeting representa tives of the United States and of nineteen Laim American countries met in Mexico City Argentina alone of the American republics was not represented At this meeting Lebruary 21 to March 8 1945 the Act of Chapultepec was adopted This agreement provided for the defense of the Western Hemisphere in time of war It is expected that many such regional agreements will be reached in the future Finally, filty of the United Nations (see box) gathered at the San I rancisco Conference April 25 June 26 1945 to consider the Dumbarton Oaks proposals It was necessary to change these proposals so that they would fit into the general scheme of the Act of Chapaltener and regional security agreements which Rus sia had made with Britain France Poland Czechoslovakia and Yugoslavia At the close of the San Francisco Conference representa tives of the nations present signed the charter of the United Nations Organization The charter is accompanied by the statute of the

International Cours of Justice The United Nations Organization is

known for short as UNO It consists of the General Assembly the Security Council the Trusteeship Council the Secretariat and the International Court of Justice

In the General Assembly all nations large and small have an equal voice. The General Assembly is intended to serve as a town meeting for the United Nations, where all can say what they think. It is to meet at least once a year, and more often if necessary

On the Security Council sit representatives of eleven member nations The United States Britain Russia, France and China are permanent members. The other six mem bers are to be chosen for terms of two years each by the General Assembly

In 1945, UNO had not yet chosen the city where its meetings will be held. The place which it finally chooses will also be the home of the Security Council A representative of each of its eleven member nations must al ways be there, so that the Security Council will be able to hold its meetings and do its work every day, year in year out

The great purpose of the Security Council is to maintain international peace and to take steps against any nation that threatens the peace Its decisions can be questioned in the General Assembly by any of the United Nations But their discussions can not pre vent the Security Council from taking prompt action in an emergency

In its difficult task of maintaining peace the Security Council will be aided by a Min tary Staff Committee Each nation member of UNO undertakes to tell the Council what armed forces and facilities it will place at the Council s disposal Each member will supply air force groups to the Security Council so that the Council may be able to act promptly argainst an attacking country.

WHAT IS THE BIG FIVES VETO POWER? WHY IS IT IMPORTANT?

The Security Council will be able to use these planes and other military forces on one the continuation of the council of the

taking action
The Economic and Social Council is responsible to the General Assembly It will
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with the prosperity and become as impeople in all more and the Security Council
will be in keeping the world safe from an
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and others that may be created in the act
council This Council the Council Council
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without considering their military or indistrial strength and it is in this Council that
the small nations can make a most valuable

contribution to the work of UNO Inother important organ which is also re sponsible to the General Assembly is the Trusteeship Council In the San Francisco Charter, the United Nations agreed to ad vance the welfare of dependent peoples and to promote their 'progressive development toward self government or independence UNO may act as guardian not only for ter titories taken from Germany Italy and Ja pan as a result of the war but also for colonies now controlled by the United \a The administration of any territory placed in trust with UNO will be supervised by the General Assembly through the Trus teeship Council On the other hand the development of any part of such a territory

designated as strategic will be supervised by the Security Council

The Secretariat will supply the people and

the facilities to operate all the various parts of UNO and will carry out their technical work. The Secretariat is to be headed by the Secretary General of UNO. The International Court of Justice will consider disputes voluntarily brought before it by nations.

The charter was s gned by the representa tives of fifty nations on June 26 1945 Then one more step was necessary To bring the charter into force it had to be ratified by

twenty n ne nations

The United States was the first of the powers to accept the San Francisco Charter On July 28 the Senate ratified the document by a vote of 89 to 2 This was a remarkable contrast to the refusal of the United States

in 1919 to join the League of Nations
The twenty ninth nation ratif ed the charter on October 24, 1945 and the charter became a part of the law of nations. The twenty ninth ratification was that of the Union of Soviet Socialist Republes.

The UNO is an experiment. Whether or not it works will depend on all of its member nations. But if we co-operate with each other, we can strengthen the web of our mittersts. Co operation will some day prove to be a greater sateguard against war than the most costly armaments.



Co-operation English children nend food to Europe

UNITED STATES

WORLD W.R. II is now at an end. In the year of special position and states and its allies dealt, the Axis a series of smashing bloos that forced first Germany and then Japan to give up the fight. Vlay 8 was V. Pay—the day of vetry over the ferman in Europe. The Japanese surrenders on September 1. Unated States time. The corresponding to the state of the states of the states of the September as was proclumed as X. J. Day—the day of vetror work the Japanese surrenders of the September as was proclumed as X. J. Day—the day of vetror work the Japanese that day of vetror work the Japanese the day of vetror work the Japanese that day of vetror work the Japanese the th

The armed forces of the United States placed an important part in bringing allows the final defeat of the Axis powers. American bombers and pursuit planes jouned the British Royal Air Force in bringing destruction to the industries and the transper ration system of Germany American armies took part in the final assault on the nail fortness.

the article on Furone

The contribution of the United States to the defect of Japan was greater than that of any other nation. American land forces won all important bases on the slands that naged Japan as empire Merican must and air poner was chelly responsible for draving the once mighty Japanese navs from the seas. The fearful air bomburg of Japans home islands was almost entirely the work of American plant.

Many scientists—British Canadian French German and Danish as well as American—contributed directly or indirectly to the development of the atomic bomb let it was the United States which made it a practical weapon—as weapon that destroyed the Japanese will to resist almost in a day see the articles on Asla and on Amore

Fretzy
Trestdent Franklin D Roose elt the great
wartume leader of the United States dad not
tive to see the final day of victory He duel
suddenly on April 123, 1945, at Warm
Springs Georgia and was succeeded by ViceFrestdent Harry S Truman Roosevelt a
death had faltle or no effect on the outcome
of the war, since his Successor carried and
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Modern warfare is not carried on entirely on the feld of battle. It is also waged in the factories which turn out the supplies of war ships tanks guns ammunition—without

which a great army would be a belpless mob The Linted States which is the most highly industrialized country in the world played the leading part in this war behind the lines

America's war production was almost un believably great Chairman J A Erug of the War Production Board revealed in October 1945 that in five years America had made 97 000 bombers and 200 000 other military planes 17 000 warships 50,385 tanks 2 43,5000 rucks 17,400000 rulles and side-arms 41,000 000 too rounds of small arms ammunition and 43,7000 too ocole blanks:

The United Stries was able to equip its own vast arms: and also to ship supplies under Lend I ease to its allies. In a report issued toward the end of August President Truman announced that up to July 1 1945, the Linted States had supplied its allies with \$43 809,83 000 worth of goods on fend leave terms Oreat Britain had received leave terms. Oreat Britain had received the result of the state of the result of the result of the state of the result of the resul

America's allies contributed to ber needs under reverse Lend Lease in the form of barcacks airfields offices, places of recreation food and so on Up to July 1945, the United States had received \$5,600,364 coo worth of reverse Lend Lease Most of this was supplied by Great Britain and her domainors of Australia and New Zealand

Of all the chief partners in the struggle against the Axis the United States allow escaped the destruction that makes modern war so terrible. Her cities were not bombed her fields were not laid waste, her industrial plants remained lintact.

Let if the horrors of war were not carried to America s soil the constant fighting all over the world took a heavy toll of American fighting men. A report Issued in October 1945 issted the Army's casualties at 922 533 (By casualties we mean men lost to the fighting services because they have been

killed wounded captured or sick or because they are missing) Navy losses in the same period amounted to 145 570. The total American casualties were about three times those suffered in World War I.

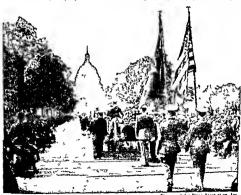
The financial cost of the war to the United States has been staggering. By Y J Day the United States had spens on war a total of \$289; 15 rose one than another country had ever spent for this purpose. But thus amount does not represent the total cost of the war to the United States In the years to come many more bullons will have to be spent or come many more bullons will have to be spent on pensions for service men and women on education and other benefits for veterans in interest on loans and the like. The total figure will probably be several times as great as the one that we have given above.

After the fighting was over, the victorious allies faced the problem of rebuilding a shattered world. First of all it would be necessary to feed the hungry and give shelter to the homeless. The principal part in this work

of charity has been played by the United Nations Rehef and Rehabilitation Adminis tration (UNRRA) an organization composed of forty four members of the United Nations The United States has contributed almost three-quarters of the total funds of UNRRA An American Herbert H Lehman

is the director general of the organization. While UNINA provided valuable help in the form of immediate relief at could not solve other problems brought about by the most terrible war in all history. It would be moesterrible war in all history. It would be necessary to build new houses factories and merchant ships to replace those destroyed in the war. It would be necessary to restore wrecked transportation systems. It would be necessary to provide new farm equipment and new equipment for oil fields. The nations of the world looked for help to the United States which had suffered least from the travages of war.

America made it clear that she was willing to do her share in belping to bring back world pro perity. In July 1044 delegates



Bearing the Sag-draped ceffix of President Rosserolt noward the Capital, we route to the White House services.

from lorty, nations had signed an agreement called the Bretton Woods Monetary Plan II proposed to set up a special fund to support the currences of needy countries II also provided for an international bank which would lend money for reconstructions work in regions land waste by the war. In Judy bill formulay approving the first the work of the work of the war with the proposed proposed to the proposed proposed to the work of the work

SHORTLY AFTER THE WAR'S CLOSE IT WAS ARROUNCED TRAT LEED LEASE WOOLD RED

Some members of the Linted Nations expected that they would continue to receive len! lesse supples after the end of the war But on Vugust 21 1943. I resident Truman unnounced that steps w uld be taken at ince to discontinue all lend lesse operations and to natify foreign governments receiving Lend Lease of this act on

Great Britain protested strongly other countries also expressed their fear of the consequences. But President Truman made, it clear that Lend Lease was definitely at a end. He pointed out that the Linted States was will got help its portners among the United Nations with rule-taintal sums in order to bring linck prosperity to evich and every one. But these sums would be granted unly in the Great of long.

only in the form of 1988

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If we insisted on full payment for these items said the Irea lent we would upset the financial structure of these affices and we might well lay the foundation for a third world wir. The President's ternarks were not layorably received by Congress Secretary of State Byrnes hastened to print out that the President had not set up a policy but had made only a suggestion.

The United States has taken a prominent part in the effort to bring about world peace through a new league of nair inst-the United Nations Organization (UNO). A definite plain for this world unit in was prepared as the Dumbarton Oaks Estate near Washine.

ton D C in August September, 1944 Del egates from fifty nations signed the perma nent charter of the UNO at San Francisco on June 26 1945 See the United Nations and World Peace

The end of the war found the United States with by far the buggest multiary machine in its history. The Army numbered Results was the State with the State of the State Stat

This was based on (1) the length of time in service (2) the length of time oversas (3) certa in decorations won in service (4) the number of dependents 11 is estimated that the Army discharged 2,000 000 mm between V E Day and the end of 1945 About 6000 000 will be released by July 1 1946 On V J Day the United States Vary was by far the largest in the wold It numbered.

On 1 Day the United States 'any was by far the largest in the would it numbered 3,380 000 men and women it had about 100 000 ships and boats of all classes in cluding 1500 warships Secretary of the Nay Forrestal announced that the Nayy meant to reduce its numbers to a peace meant to reduce the number of the number o

It was planned to keep about a housand ombat ships with supporting aircraft and supply vessels. One third of the fleet was to be kept fully manned and rendy lof any emergency. One third was to be held in reserve and ready for action at short notice. One third would be taken out of act vestrice but would be asken tool fact with the some future time if needed.

OF OVER 1000 PER CRET DURING THE WAY

On V J Day the Army Air Forces (AVF) numbered 2 500 000 men and women an in crease of more thin 1500 per cent since the United States entired the war in De-ember 1941. It was planned to cut the AAF to about 900 000 1 y July 1 1016. After that time the figure would be reduced still further probabily to about 700,000.

On November 20 1945 President Troman nonounced a change in the leadership of both the Army and the Navy General of the Yeny George C Vlarshall Army chel of staff and Fleet Admiral Ernest J King chel of avail and operations had sent in their chel of naval operations had sent in their

resignations General Marshall was replaced by General of the Army Dwight D Easen hower the successor of Admiral Ling was Fleet Admiral Chester W Nimitz

To provide necessary replacements for the armed services it was planned to continue the draft of men between the ages of eight een and twenty sax for some time to come for other, 1945. President Truman urged Congress to pass a law setting up a perma nent peacetime draft. He recommended that young men between the ages of eightern and twenty should be required to undergo a years military training. The, would then become members in the general reserve for a period of say vars. Congress had not acted on the Prevident a suggestion by the end of 1045.

THE PROPOSAL TO UNIFY THE ARMED FORCES BRINGS FORTH MANY DIFFERENT OPINIONS

Another important military matter that came up for discussion after the end of the war was the question of unting America's armed services under a single head. In October 1945, the War Department offered a unification plan to the Senate Military Affairs Committee Under this plan the Army Navy and Air Forces would be placed under a single civil an Secretary of the Armed Forces. There would also be a Chief of Staff of the Armed Forces. There would also be a Chief of staff of the Armed Forces he would also be a Chief of staff of the Armed Forces he would also be a Chief of staff of the Armed Forces he would also be a Chief of staff of the Armed Forces he would also be a Chief of Staff of the Armed Forces he would also be a Chief of Staff of the Armed Forces he would act as chief adviser to the Secretary

The Nary was bitterly opposed to the War Departments sunfaction plan Sere tary of the Navy Forrestal maintained that the rivalry between the services was a healthy one and should be kept Toward the end of November he offered another plan which he said would bring about real unsteament of the said would bring about real unsteament has to be served to be s

Those in favor of unification claimed that lack, of co-operation between the Army and Navy had been chiefly respons ble for the heavy losses suffered on December 7 1941 when the Japanese attacked Pearl Harbor In November 1943 a congressional committee began a thorough mrestigation of the mode with the control of the con

It is difficult to set up a definite military



hard bitting new desiroyer sudes down the ways in wartime launching It joins the world's biggest savy

policy for the future because the atomic bouth threatens to change all accepted deas about warfare. The striking power of this new weapon is so great that a single surprise attack might cropple the mightiest nation fatally in a few boirs. It is true that at present the United States alone has the secret of manufacturing the homb But those who know most about the matter claim that other nations will have atomic bombs in five years.



Constal of the Army Dwight D Elsenhaws on his return to Washington D C wayss to the crawds

—or perhaps even in a shorter time Some people think that the Linted States should help quiet the fears of the world by sharing its secret with other nations. Other people feel that this country should keep the atomic bonds a secret as long as possible and that research in atomic energy should and the should in the same of the May Johnson Bill introduced no express and collecter, 1945. This far, no actions has been taken on the measure.

closely associated with the United States in the development of the atomic bomb British and Canadian scientists worked on the proect in the United States Canada made avail able the Great Bear Lake deposits of pitch able the Great Bear Lake deposits of pitch blende This is one of the world's greatest stores of uranium bearing ore—the ore from which storuc energy is derived at the present time

In November, 1945, Prime Minister Attlee of Great Britain and Prime Minister Mackenzie King of Canada went to Wash ington in order to discuss with President Truman the future of the atomic bomb The three statesmen usued a joint statement in which they recommended (1) that the secret of the bomb should be kept by the United States for the present (2) that steps should be taken by the United Nations Organization to outlaw the use of atomic energy in warfare and to promote its use for peaceful purposes

The year 1945 was one of the most critical in the history of American multustry It was a year in which the country had to change from a wartime to a peacetime basis. Thoughtful people had realized that this the properties of the

As the year opened the country was in the masts of the war effort. We have already told you of America wast war production, which left french and lose is behand. Yet which left french and lose is behand yet of tols, the United Star in the early mondate and power shortage in certain industries. A number of workers had left their war jobs for jobs in civilian industry because they had been war would be over soon Others had been war would be over soon of the star of transportation difficulties.

LABOR PROBLEMS IN ESSENTIAL INDUSTRIES BRING FORTH NEW PROPOSALS IN CONGRESS

In an effort to provide enough workers for essential kar work, the Roosevett Admins tration tried to push a labor drift bill—the May Bauley Bill—through Congress The House passed the measure in February, but the Senate Committee on Milray Affairs refused to bring at to the floor of the Senate refused to bring at to the floor of the Senate work of the Senate of the Senate of the Senate green of Machanism then supported the Ma Serve O Machanism the support of the Senate spece O Machanism to the Senate of the five the man power thortage by strengthen in the station of War Man Power Commission. The kilgore-O Valxoney Bill also failed to win the approval of Congress

While certain andustries were desperately searching for where, in other industries there were a number of cutbacks—that is reductions in original schedules On March 77 the Navy announced that seventy two combat ships had been cut from the naval building program of eighty four announced on March 6 There were also cutbacks in the manufacture of ammunition tanks small arms and powder As a result a number of workers lost their jobs.

The industrial picture changed suddenly after VE Day even though the war against japan had not jet been won. Cuthacks in creased by leaps and bounds so d d the number of unemployed Industries that had hitherto been prosperious found themselves without the war orders ap which their prosperits had been based. Soon the country tomal useful plunged in the difficulties of the reconversion period.

Teconversion period.

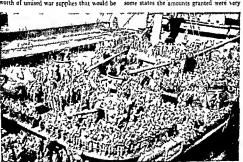
Certain steps had been taken before V E
Day to prepare for the commg of reconver
sion Congress had safeguarded veterans re
turning to civilian life by passing in June
1944 a bill known as the GI Bill of Rights
(GI is a war slang term meaning an ordinary
soliker) This measure provided free school
ing a year's unemployment compensation
generous loans and other benefits to veter

ans
In October, 1944 an Office of War Voob
latation and Reconversion had been set up
m order to supervise the entire reconversion
program At the same time a three man Sur
plus Property Board had been created an
order to dispose of the billions of dollars
worth of unused war supplies that would be

on hand when the end of the war came In March 1945 three leaders of labor and industry had met at Washington in or der to discuss the labor situation in the reconversion period These men were Presi dent Will am Green of the American Federa t on of Labor President Philip Murray of the Congress of Industrial Organizations and President Fric A Johnston of the United States Chamber of Commerce They drew up a seven point charter which aimed to bring about a new era of peace and harmony m the field of labor relations. The charter guaranteed collective bargaining high wages and the rights of private property under the system of capitalism

The War Froduction Board promised that it would release needed materials for the use of civilian industry with the coming of peace—perhaps even before that time if possible The Office of Price Administration promised to do away with the completed system of rationing as soon as possible

All these measures represented at least the beginnings of a return to peacetime ways of living. Yet much had been left undone. What of unemployment? War workers losing their jobs would be entitled to unemployment compensati n given by the states. But the warnous state systems differed widely in



Tres Asser 5 ore Jan

Petersa soldiers of the African and Italian campaigus appress their hamocoming joy as they deck at Now York.

small In 1944 President Roosevelt had backed a bill providing for adequate compensation to the unemployed for a period of six months. Congress had refused to pass the measure

Nothing had been done either to set up a wage policy for the reconversion period During the war workers in defense industries and many workers in civilian and notistries had worked fortly eight hours a week on an average with pay and a half for overtime water would be no overtime work in most in district Labor leaders announced that they would set harge increases in wages in order to make the amount of take home pay doubt the set of the work of t

And what of strikes? If they became wide spread they might hamper midustry seri outly in the reconversion period and both outly and labor would suffer Senators Ball Burton and Hatch had introduced a measure providing for compulsory arbitra tion in labor disputes Congress refused to consider this bill because the Administra tion organized labor and management were

all opposed to it

And so the country entered upon the period of reconversion with only a partial program. The result was great confusion. As had been foreseen, the unemployment peob

lem became serious Half a milion men and women lost their jobs in the month after V E Day The United States Employment Service (USES), a wartime agency which provided free employment service for work ets was swamped with applications for jobs

A way a current with applications of the form a reason where the number of unemployed roce sharply many factories reported that they were desperately in need of workers and could find none. There were various reasons for this Some men had worked long hours for they wages in war industries they felt that they needed a rest and they could afford to take one Some of the jobs that could not to the control of the control of the them they could afford to take one Some of the jobs that could not of the unemployed did at which many cases the wages offered were low. A man taking a pho of this kind would not get much more money than he would if he remained wite and collected unemployment compensation and the and collected unemployment compensation.

And so certain industries were hampiered by lack of workers in their effort to get hack to peace production. Other industries were held back by strikes. Some arkies were called because workers were diseastisfied with working conditions or because they wanted to have certain union groups recognized thost strikes. however were the result of wage disputes. The efforts of labor leaders to obtain large merases were met with a flat refusal in almost every case and thus delt or cripping stoppages of york in many

important industries. The Green Murray Johnston char ter was ignored in this crisis It had never been anything but a hopeful statement of principles. It had never been accepted by organized labor or by industry as a whole.

by Industry as a wolf. Day The company of V Day The company of V Day The company of V Day Western the control of the Company of V Day Western the Company of V Day On the Comp

The President now pre-



President Herry S Truman jelus with high military and navel leefers inspecting the original document with it rate and the surrouter of the Ji ansee The signing took place on board the hattleship Missouris Tokys B.

sented to Congress a far reaching program which would deal with all the difficulties brought about by reconversion Among other things he proposed (1) to hold the line on prices for a time, (2) to hold wages in line where increases would lead to higher prices (3) to remove government, comirols where

where increases would lead to higher prices (3) to remove government controls where possible (4) to extend federal aid to the states so that each state would be able to pay its unemployed people up to \$25 a week, for twenty six weeks (5) to insure full employment in the days that lay ahead (4) to provide a well rounded crop insurance-program

Congress refused to heed the Pres dents phea for speedy action on his program The stuation continued to be serious The na tions entire industrial production was threatened in September by strikes in the vital oil and coal industries On October 4 the President ordered the Navy to seize and operate twenty six oil producing and refin ing companies in order to get the strikers back, on their jobs The Government would probably bave taken action in the coal strike too if President John L Lewis of the Mine Workers Union had not ordered the strikers back to work on October 17

OUVERNMENT POLICY ON WAGES

On October 20 the President announced that the Government would no longer seek to control wages He announced however that manufacturers granting wage increases would not be allowed to increase prices without government approval Price increases based on increases in wages would be per mitted only if (1) previous wage increases had not kept up with the cost of living (2) wage increases were necessary to make wage rates more or less equal among plants in the same industry or place (3) wage increases would have to be granted in order to insure full production in an essential industry. The President declared that industry as a whole could afford substantial wage increases without any general increase in the price But most manufacturers disagreed

On November 5 a labor management conference was opened in Washington in an other effort to bring about peace on the home front. There were eighten labor delegates eighten management delegates and three non voting government representatives. The labor delegates were drawn from the ranks of the American Federation of Labor, the Congress of Industrial Organizations and two independent union groups—the railways.



Offic at Ln ed b es Na y p o g ap

workers and the mme workers. The conference failed to bring labor and industry to gether. Serious strikes continued to endanger the entire reconversion program.

The nation's farmers were handicapped by unfavorable weather April frosts caused great damage in many areas floods raged in the Viddle West Nevertheless the 1945 crop was unusually large and farmers en joyed another prosperious year. The Bursau of Agricultural Economics estimated that the farmers cash income from the sale of their products amounted to over \$20.000.

000 000 in the year 1945

The problems of reconversion have af feeted all Americans—even those who have taken no direct part in the cooffice between labor and molastry For one thing it bas meant the easing of many controls which had been a reflect during the war A number of articles had been rationed in order to as sure a fair supply to all Alter V J Day first one article and then another was taken from the ration last. The most fair reaching step in the direction has diken on November 23 to the control of the control of

Price controls are still in effect and will probably be applied for some time to come the Office of Price Administration (OPA) sometimes raises prices on certain items in order to encourage production but in gen and in flation. The OPA has received the support of organized labor but has been severely at

tacked by the country's manufacturers

In spite of price controls at seems certain that the price of food will rise as subodies (special payments) are I fted The Govern ment has been paying these subsidies to producers of agricultural or dairy products (1) to enable the farmer to make a reasonable profit and (2) to keep the prices of food ar ticles from rising

STOPPING AID TO FARMERS MAKES FOOD PRICES GO DP

nounced that subsidies would be gradually removed between that month and June 30 1946—the date that Congress had set for the litting of all subsidies. The effect of such a program was seen on Norember 8 when the Government removed one of the two subsidies controlling the price of butter As a result there was a rise in price of between five and of the two subsidies controlling the price of butter As a result there was a rise in price of between five and six certain a pound

In November 1945 the Government an

Toward the end of November 1945, officals of the OFA and the Department of Agriculture issued a report on the monoid of subsidies. They predicted that is a second the prices of at least thirty seven imposed the prices of at least thirty seven imposed tenses would increase from 10 40 per cent The ttems included meats bread butter mulk, canned vegetables cheese and drade fruits. These increases could be avoided only if Congress voted to restore all subsidies.

The housing situation which was serious in wartime became even worte after V J Day Conditions were particularly had in the larger cities. Many of the particularly had in the larger cities. Many of the process work decided to remain after the work work decided to remain after the work was turning veterans added to the number of those seexing suitable quarters It was clear that a huge building program would be necessary to case the housing shorter.

that it had previously granted

The coming of peace has lightered the burdens of American stays ers. In November 1945 Congress passed a bill provide of considerable reductions in faxes for both corporations and individuals on income for 1946 Th's measure will bring, about a tax cut of about \$5 000 000 000 it will remove an estimated 12 000 000 Americans from the nation's tax rolls

Organized labor continued to make steady progress in 1045. The American Federation of Labor (AFL) has about 7 000 000 members the Congress of Industrial Organizations (CIO) 6 500 000 A large number of workers estimated at from 2 000 000 are organized in independent un 000000 are organized in independent un

ions—that is unions not forming part of the

The National Labor Relations Board (LNEB) made an important labor deason on March 26 1945 It announced that formen and other supervisors can form unions for the purpose of collective bargaining and with these timens. This range and bargain with these timens This from an observed that the summer of the summer

Another problem of deep interest to labor is that of loil employment throughout the year Many industries are seasonal that is they offer employment for only part of the year Organized labor has held that this policy is unlast to workers and that they should be guaranteed a definite yearly wage Only a few industries have given such guarantees are with guaranteed and the proposed of the workers have given such guaranteed and the proposed of the

On July 28 1945 the National War La bor Board issued an order providing for a guarantee of full employment throughout the year for 300 shor salesmen in New York City This was the first order of the kind ever issued by the board A week or so later government investigators began a careful study of the problem of guaranteed employ ment This study is still under way

THERE WERS MANY CHANGES IN THE CANTACT AFTER HARRY S TRUMAN BECAME PRESIDENT

There were changes in the presidential cabinet in 1945 On January 21 Secretary of Commerce Jesse Jones resigned at Press dent Rossevelt as request. The Press dent then named Henry A Wallace former wee press to its succeed VIr Jones The Senate reference of the Comment of the C

When Mr. Truman hecame president in April it was freely predicted that there would be a big shake up in the Cabinet This prediction was certainly fulfilled Over a perod of four mouths there were no less than seven Cabinet changes as follows: (1) Tost master General Robert E Hamegan replaced Frank C Walker (2) Attorney General Thomas C Clark replaced Francis J ~:54.-

Biddle (3) Secretary of Agraviture Cinton P Anderson replaced Claude R Wick and (4) Secretary of Labor Lews B Schwellenbach replaced Frances Perhams (5) Secretary of State James P Byrnes replaced Edward R Stettmus Jr (6) Secretary of the Treasury Fred M vinson replaced Hongred Morgenthau Jr (7) Secretary of War Robert P Patterson replaced Henry R Stumson R Stumson

There were also many changes in the government agencies that had spring up during the war Some were abolished these in cluded the Smaller War Plaints Corporation (SWPC) the Office of War Information (GWI) the Office of Economic Stabilization (OES) the Office of Strategie Services (OES) and the War Production Board (WPB) In most cases the duties of these organizations were furned over to other fed

eral agencies

The important National War Labor Board was still in existence at the end of 1945 but it had changed its policies considerably. It refused to take up disputes between employers and workers unless both sides agreed to accept the board a decision. Furthermore is no longer ordered strikers to go back to

work it merely requested them to do so. There was only one change in the membership of the United States Supreme Court in 1945. On July 5. Associate Justice O sen. J. Roberts resigned he announced that his resignation was to take effect on July 31. Unstice Roberts a Kenublican had been applicable.

pointed by President Hoover in 1930 On September 18 President Truman nominated another Republican Senator Harold H Bur ton to succeed Justice Roberts The nomination was confirmed by the Senate the next

Associate Justice Robert H Jackson of the Supreme Court was named by President Truman as the chief United States counsel on the International War Crimes Tribunal a court set up by the Allies in order to try Aus war criminals Justice Jackson obtained a leave of absence from the Supreme Court in order to serve on the Tribunal This body opened its trial of accused nazi leaders on November 20 1045 After the nazi defend ants had all pleaded not guilty Justice Tack son opened the prosecution a case Claiming that the real complaining party at your bar is civilization he charged that the defend ants were responsible for the war that Hitler planned war with the United States in 1940 and that the Japanese plotted in 1939 to assassinate Josef Stalin The legal proceed mes were watched with interest due to their lack of precedent in international law

Such is the story of the United States in the year 1045 It ended on a rather doubtful note 'smerica had come through the ordeat of war with flying colors but she had not done so well in solving the problems that peace brought with it There seemed to be need of recalling to all Americans the lesson

learned in the trying days of war that in



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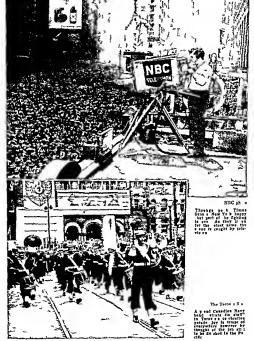
V-DAYS

Marines who becam the great effective against Japan It ten a an arway of the was and Offi a U S Ma in Corpa photo



[530]

CITY CROWDS GREET VICTORY IN EUROPE



[331]



By Gerald J. Holton

Harvard University

UR whole universe is filled with rays. shooting past or through one another at enormous speeds Unlike sound (which needs some medium like air or water through which to move) all these various kinds of radiation can travel through quite empty space, such as the lonely vacuum between the sun and our earth They are really an absorbing study, and a study which affects many other muracles of nature

In discussing a topic of this sort which is so closely connected with many other scientific wonders, there is a possibility of men tioning allied subjects which have been treated elsewhere in your book. It is felt, however, that the great interest in rays jus tifies a separate and complete explanation

LIGHT, THE RAYS MY WHICH WE SEE

The rays we know best are the visible rays of light This light belongs to a great family of waves In this family there are also light waves we can not see-infrared waves and ultraviolet waves-as well as X rays, gamma rays and radio waves

This is a good place to tell what the difference is between a ray of light and a wave of light Suppose you dropped a stone into a still pool of water, and watched the dis turbance it created If the center of all that disturbance were to be considered a light bulb, then the ripples, or waves, of water

that go out in all directions from that center might be thought of as waves of light If, however, you were to draw a straight line from the very center of the disturbance to a point on the shore of the pool, this line would indicate the direction of the wave motion with reference to that point on shore This fine would be called a ray It is a term that is loosely used to designate any narrow beam of heht

Two other terms you will often see in any discussion of light are wave length and frequency These may be explained as follows Suppose you could run from one pole to an other ten yards away in one second, then to another ten yard pole in one more second and so on past ten poles till you have run one hundred yards in ten seconds. The rate of your running would be ten yards, or one pole length, in one second In science, your rate might be known as your frequency, and it would be one pole length per second Saying the same thing in a different way, the en tire course of one hundred yards is divided into ten lengths of ten yards each. There are then ten complete lengths, or cycles, in all, each evele being ten yards Science calls this distance the wave length, or the distance be tween two corresponding points on adjacent cycles It is then easy to see that, if the dis tance between poles, or wave length, is in creased the rate of your running one pole length, or your frequency, would decrease



The electromagnetic spectrum above to charted in approximate wave length volume. It includes visible light-rays and standard broadcast waves. The latter vary in spage from 7,500 to 21 500 fackes, or 500 to 1,500 kilocycles.

As physicists say, the wave-length is in versely proportional to the frequency

But let us get back to the light rays how are they created? When one of the outer electrons of an atom is disturbed in its remi lar rotation about the nucleus-for instance by a collision with a 'free' electron-then a small bundle of pure energy is hurled away from the atom as the displaced electron jumps back into its own orbit. This bundle of energy is sometimes called a quantum. sometimes a photon It flies away at tremendaus speed-186 ogo miles per second If some special power were given you so that you could look into an atom and sec the dis turbed electron being knocked out of its place, and then darting back into place again you would see a tiny flash of light Such a small flash would not amount to much But suppose you could see the same thing happen in many peighboring atoms at about the same time -then you would really sec light being created—many photons shooting out together and forming a spread ing light wate. The more violent the atomic disturbances that create the photons the greater is the energy each represents. And the shorter the wave length the higher is the frequency of the resulting light rays.

Light waves with a wake-length of thirty mullionitis of an lich arouse in our eyes the sensition of red color whereas raw with half that wave length seem volet. Between these he all the other colors of the rambow—the titud spectrum of light. The subject of light is discussed more fully in your Book or Kwok Iznor. The chapter called Light and What Makes it would be a helpful one for

you to read

LIGHT WAVES TOO LONG AND LIGHT WAVES TOO SHORT FOR US TO SEE

Our eje fails to noise any rass of longer wave lengths than that of red and rone shorter than the voilet rays nevertheless such rays east. The chart of the whole electromagnetic spectrum shows you that the infected rays which our skin can feel as keet rays are wases just fist fails, that with wave-lengths man; times longer, up to one third of an inch

At the other end of the visible I ght hand there is the ultrativolt region with watelengths down to one half a millionth of an inch T i predace these vers short serve high frequency waves much greater disturbaness to the alons are required than are necessary to cause infrared or six He light. The energy than the consistency are supported by the support of the substantial transition of the subs

make possible the creation of such high fre quency, short wave-length radiation in great amounts. Ultravoiet radiation from the sun that the sun and the sun amounts of the sun destroyed by it if the earth's attravely the destroyed by it if the earth's attravel the offen not protect us. Luckly most of the first wolet rays are absorbed by a layer of zone sax trenty miles above the earth!

PARTO WAYES

Electric and tadio waves tracel with the same speed as inferred unible and ultra wolet rags that is 186 ooo miles per second Lake the light 186 ooo miles per second Lake the light 186 ooo miles per second waves are capable to get the same tags of the same tags

THE X RATS THAT START FROM THE INNER SHELLS OF ATOMS

Let us now turn to the electromagnetic waves with even shorter wave-lengths than ultraviolet light-the \ rays and gamma rays To create \ rays it does not suffice to disturb the outer electrons of atoms we have to shoot very fast electrons from a special electron source into the inner orbit of an atom of some material like copper or tung sten This will knock out one of those inner electrons such a catastrophe near the nu cleus results in emission of a very powerful photon The rays formed by these photons may have wave lengths only 1 no the length of ultraviolet waves and you remember how short those are But the \ rays have tremendous energy They can pass through many substances that stop I ght rays They can cause some chemicals to fluoresce and photographic plates to become exposed. Thus we are able to examine indirectly the inside of many olorers. The dentist takes an \ ray picture of your teeth, for example The rays go right through the hard enamel and show in the picture the condition of the invite of the teeth

THE GAMMA RAYS THAT START FROM THE MUCLEUS OF THE ATOM

Fren shorter and more powerful than trays are gamma says (grays). To get these we must produce disturbances inside the very nucleus of atoms! In your imagina tion watch an atom breaking up owing either to radioactivity or to bombardment with high speed particles. It is possible that a neutron in the nucleus may split up into a proton (positive) and an electron (negative) In such a stolent separation into two particles a large amount of energy is released as photons—and these form the gamma rays Their wave length varies according to the nucleus from which they come. The energy contained in such rays is so great that some gamma rays are able to split nucles of heavy atoms just as high speed neutrons do. That is a remarkable thing-lot the photon represents pure energy while the neutron is a real particle

Incredible though it may sound gamma rays are also produced when units of nega tive electricity (electrons) collide with tiny units of positive electricity (the positron particles) Pair by pair these two kinds of particles completely annihilate each other, and in their stead remains pure energy in the form of photons of the gamma rays And conversely if a gamma ray be stopped by a heavy metal it may happen that the photons of the ray break up into pairs of electrons and positrons' Thus in watching the be havior of these rays and particles we realize that we can not make a very clear distinction between particles (matter) and photons (energy)

BETA RATS AND

ALPRA PARTICLES As you know the nucleus of an atom is ordinarily composed of only two kinds of particles, positively charged protons and equally heavy but uncharged neutrons But when atoms disintegrate (break up) various rays can be emitted (sent out) from the nucleus which may consist of particles that must have been produced there during the disintegration In telling about gamma rays we said that a neutron inside the nucleus might split into an electron and a proton When this happens to many atoms at the same time, the photons are sent out as gamma. rays and the electrons too are emitted at high speed from the nucleus Such electrons form beta rays (\$ rays) Radium for in stance emits beta rays which are high speed electrons as well as gamma rays Radium also emits aloha rays (a rays), which are streams of big and powerful particles each a combination of two protons and two neu trons It becomes evident from this that the structure of an alpha particle is iden

OTHER RATS RMITTED WERE ATOMS BREEK CF

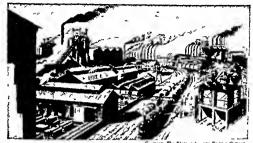
Besides a \$\beta\$ and \(\text{rays}\), the other rays that sometimes are emitted when atoms break sip are made up of traveling neutrons protons portions and deuterons. Positrons are just like elections except that they are positrilely charged. A deuteron is a particle compassed of one proton and one neutron. That is its articuture is like that of the miscleus of the beavy' hydrogen isotope deuterium.

THE MYSTERIOUS COSMIC RAYS

Last). Ict us look at the mysternus type of radiation called cassure roys. It has been known for a long time that our earth is being bombarded from the outer world (the cor mos) with rays so powerful that they will go right through many teet of lend Instruments have recorded them at the bottom of deep lakes and in mines inside great mountains. We can not escape these rays.

let despite many years of work by some of our greatest physicists we do not know with certainty whether these rays are par ticles like Bray's or photons tike Tray's Balloons sent up high with instruments have brought back final evidence that the strong magnetic field of the earth bends the rays even at great heights-which seems a par ticle-like behavior for these cosmic rays But just how large the particles are and what their charge, we still can not tell Also, these rays seem to have some photon rays mixed in with the particles If there are such cosmic photon rays they must be of even shorter wave length than gamma rays We know that because they have so much greater energy than the gamma rays

How and where cosmic rays are created is still an unsolved riddle—perhaps waiting for explanation by some future young scientist who once received his first stimulation for investigating the mysteries of our world by reading the pages of this book.



Courtesy The Fleet c 4 see fis to y Compar

THE DISTRIBUTION OF WEALTH

By Graeme O'Geran

I CONONICS is the social science concerned with the production consumption exchange and distribution of wealth. In the article beginning on page to a you read that four things go into the making of wealth— Hand Libor, capital and management by the enterpriser Thees are called the factors of production. You we shall learn how all production. You we shall learn how all the production of the production of the contraction of the production of the contraction of the production of the contraction of the

In some cases a man labors on his own land and uses only his own capital. There are many small farmers who are in this post too. Such a man gets he hiving from tilline and the capital constitution of his capital constitution of his building his his capital constitution of his building his his capital constitution involved. In such a case the worker is at the same time the owner of the land a worker on It, an investore of capital and in addition an enterpriser because he supplies all the managing abulty will kit his put into the work that the capital ca

There are many other occupations in

which a single person may be at once worker landford capital it and enterpriser. For example, a cibbler or cab neimaker may work for himself in a 1 title shop which be owns using likewise tools and materials bought and paid for by himself. In such cases there arises no problem of distribution or sharing

of profis. Almost everyone was in this group before the Industrial Revolution of the nine teenth century which resulted in great changes in production methods New heat ser and more expensive machines write in vented for spinning and weaving which only the wealthy could buy and install in espe-cially constructed built ness to longer could the reasont and his wife work with a peofit the old fashion spinning wheel and form in their own I tile cottage. It became necessary for them to go to the "lactory." There they had to learn bow to operate the machines and they had to work for wager No more dal they swn the work of their hands What they created belonged pow to their em ployer but as giving up their independence as worters they also gamed some advantares. So it became common I is the mass of

the people to own perther the ruthinery

(canital) nor the land on which it was housed and they depended uron wages in return for all they had left to self-their fabor

Today a factory may be built upon land owned by another and rent is paid to the landlord. The enterpriser then heres labor to work the machines in return for wares

As we already know different names are given to the shares of the produce going to the workers, the landlords, the capitalist and

the enterprisers

Il ages and Salaries Wages are the most important single source of national income Of the 140,000,000 people in the United States around 60 000 000 work for wages or salaries in return for their share in the production of goods or the rendering of services. There is no important difference between wages and salaries Wage is the term applied to the payment made on a daily or weekly basis but when payment is based on a longer period of time as a month or a vear it is usually known as a salars

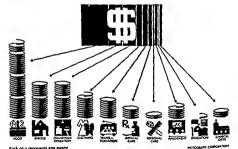
Asads of Lafor It is common for econ omists to classify labor as either physical or mental Those relying munty on obvisical effort are naturally in the first group that of physical labor This group is uself decided

into two groups the skilled and the unskilled. The automobile mechanic and the electrician are for example, classed as skilled workers while the pick and shovel worker is unskilled

The mental workers fall into either the routine group or the inventive group The routine worker such as the bookkeeper or the store clerk having once mastered the routine duties of the job is rarely called upon to use judgment or imagination. Those belonging to the inventive group are relatively lew in number-of this type would be the accountant the business executive the school principal and inventors Outstanding names in this class are those of Thomas Edison Henry Ford H G Wells and Albert Finstein

Rent Rent is the share going to the land lord in return for the use of land or some other free gilt of Nature. In a great city where almost every foot of land is in use it is very difficult to distinguish gifts of Vature from the work of men in ordinary speech therefore we come to use the word rent as applying to any payment made for the use of land and what is built on it The true "rent however is not this total payment

WHERE A TYPICAL FAMILY DOLLAR GOES



but only that part of the payment which is made for the natural piece of land

At first such a distinction may seem un important, but that is not really so Let us consider the rent of a store on a main street in a large city, and the rent of a similar building in some small village. The village store rents for much less than a similar building in a large city Why? The real reason is location. The city building is sit uated on a busy street and has so many more people passing by it than the one in the village than the shopkeeper can sell many more things in the same period of time in the city than can be sold in the village shop Therefore the city merchant is very willing to pay a higher rent. You can now under stand why in the large city the five and ten cent stores are to be found at the busiest intersections They are in the high rent" area but the high rent is justified by the amount of business done Thus the economic rent is the price of the natural advantage of one site over another

How Rents Are Affected by Vatural and Other Condutions Sot its in farming II a farm has poor soil or is poorly situated it yields less in produce or costs more to get produce to market than a farm with rich soil or one that is well located So we see how some landlords may be able to obtain a bight net while others can get only a small

Det us say that a particular farmer plants the same amount of corn on two equality welf cultivated pieces of land of indentical size located five miles apart. However in spite of identical care the farmer finds at harvest time that one piece of land yields twoce as much corn as the other Assuring as we have that all growing conditions were the same on both plots of ground, the great did same on both plots of ground, the great did



Draftsmen ers 'mental" workers Drawings for blue ptints must be in perfect scale and abow precise meas stements.

ference in yield can be due only to the differ ence in the quality of the two pieces of land Rent charged for the surplus grown on the better grade of land is given the name of economic rent

Some land may be especially valuable because there are minerals under the surface II coal or oil is discovered at a critaria spot mines, wells and factories will oping up on acres that were formerly worthless. Houses and shops will be built near by to serve the people who will flock to the area. Thus because of the natural resources the land round about will become valuable and will command a higher people.

command a nigner rem.

Again if a railway is built through an area rents will be raised. This is because people have been brought to the area and they are extended to the area and they are extended to the rail of the rail

Capital and Interest People who save money (capital) may either use it to pur



FSA photo by Vachob This greetry store is in the proprietar's home which he owned as a fine he does all the work him self, on his uwa capital, he is worker landerd, manufile and administration of manufacture and administration of the state of the s





This run-down desciate farm brings only a lew sent

chase things which directly activity then one waster of east to others sho with in make use of it. Most money so loaned is caused by business organizations for produc activities of the state of the st

There is some risk in an investment of this kind When for instance your father loans money to the government—that is buys a bond—he knows there is no risk He will receive not only interest but also the return of his money when the bond comes due Money lent in good security to an old established business firm runs some resk though a small one So it is with money lent on the security of a mortgage as it is called of good buildings where the lender's security is based on the fact that if he is not paid he may seare the buildings. In such mistances the capitalist (the one loaning the

which the courts will turn beer to him if the loan is not repaid according to its terms If Exergine Who Sared Money Wanted to Accep It Quite Sofe, There it outle Be I or Little Enterprise it is just because some people are willing to take fishs on the chance of being paid for their risks that capial comes to be invested in business enterprise However, enormous sums are often lost by

money) has a claim on tangible property

those who take such risks Profits You have learned that before the Industrial Revolution the factors of production were not separately owned Then it was usual for one man to own the land providing bis own labor and capital in order to produce whether he were a farmer cob-

bler or weaver or any other kind of worker However, with the coming of machiners all this changed One person would have la bor to self another would have land to rent and still another would have capital to in

To whom did the people go who had these factors to sell? They went to a fourth and new factor which had come into being—the enterpriser or business man. His task it was to bring together the other factors

of production in proper proportions, in order that production might be efficiently carried on It is the enterpriser then who assumes the risks for the success or failure of the en terprise He must make the decisions as to the amounts of land, labor and capital necessars in a given plant or business unit

Who is the enterpriser today? Techmcally he is either the single proprietor who provides all the land, capital and labor him self or the member of a partnership or the stockholder in a corporation, or the business executive who directs the destiny of a great organization such as United States Steel or General Motors The degree of risks involved varies greatly among these Individuals. In every case some risk is present and therefore each of these men is an enterpriser. The term enterpriser, however, is popularly applied to executives of large corporations

In return for assuming these important responsibilities and the risks involved the enterpriser is rewarded with profit Prof it is what is fest after the costs of doing business are deducted In the case of the single enterpriser, the man must pay to him self what it would have cost him to rent land, here labor, supply capital and pay a manager These are production costs Anything left over is profit In the partnership what is left after paying expenses is divided up among the partners as profit In the corporation it is paid out in the form of de-

To the economist and business man there are two kinds of profits (1) Accessory frosts are those required to give a man sufficient incentive to work as director of a business of industry. This incentive must

at least equal what the man could earn by hiring out as an employee to some other en terpriser Strictly speaking necessary prof fts are the uages of management (2) I ure profits are those remaining after the enter priser pays his labor rent on the land return on capital invested in the business and necessary profits-all costs of produc-tion. To win these pure profits of course is the aim of all business men However for husiness as a whole they are none too plents ful Neither are they guaranteed They may be plentiful in good times but may disap pear in periods of depressions. In such times even necessary profit may not exist

How the Distribution of Il calth is Deter mined The proper distribution of wealth between labor's share (wages and salaries) the landlord's share (rent) the capitalist's share (interest) and the enterpriser's share (profit) is a very diff cult matter to decide In the main the distribution of this wealth is determined by the action of the laws of

supply and demond

How Rent Is Determined Demand and supply affect rent as they affect prices of anything else, such as shoes or baseballs If many people must live in one place they all demand houses and therefore there is a big call for land at that place This demand raises the price of the land or the rent paid for the use of It

Is It possible in such a case to increase the supply of land to the people who want houses? Yes ft is possible If a building of many stones is put up more people can live on the land than if a building of only one or two stories is erected A railway or a bus line can make it possible for peor le to



Bo h pho os by Harry Ru Confe eace

we kers represented by union afficies and am players (enterprisers) on



In the clothlog lad Price Settlement



live far away and quickly ride back and forth to work. In this way the homes of the people are scattered and in effect a larger supply of land becomes available for them in which case the rent at the busy spot may fall

How the Return to the Cap talist and the Enterpriser Are Determined As in the case of the return to land and to labor supply and demand largely determine the share of national income going to the capitalist and to the enterpriser If for example as the result of an invention a new and success ful business is created more cap tal and managerial ability are required To secure this necessary capital through the sale of bonds high interest rates will be paid and the hope of greater profit will lure the enter priser to associate himself with the new proect This was exactly what happened in the early days of both the automobile and mov ing picture industries. But as more and more capital entered the field and larger numbers of enterprisers sought the rich rewards the

supply of both these factors began overtak ing the demard As a result today the in terest and dividends paid by these indus tries are about on a par with those paid by other major bus ness enterprises

Hou Il ages fre Determined We saw in studying prices in general how the demand for goods really means the demand for goods at a certain price The demand for workers in practice means demand for workers at a certain wage

The employer can not pay more than a certain wage at any particular time unless he can get greater production from the same number of workers If still more money in wages is demanded he can not pay it and he has to go out of business

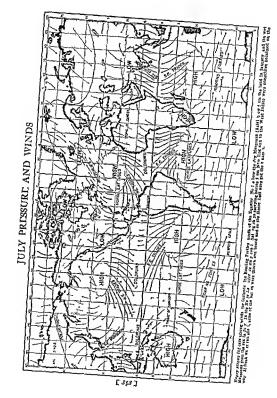
The supply of labor in a trade also gov erns the price of labor If for example a large number of workers seek jobs in an automobile plant that already has all the laborers it needs the employer may be able to reduce wages upon threat of dismissal This gives the enterpriser an advantage over the worker which can be mod fied only by good feeling and justice or by the workers trait ng

The labor union is a society of workers banded together to secure for themselves the h ghest wage which the profits of their trade allow The union if it does its duty will see that its members are not underpaid and yet it will not be so foolish as to demand a wage higher than the industry can pay However just as the employer is often a bad judge of the justice of his own case so the unions are not always wise or fair in their demands upon the employer Thus occasional quarrels arise about the distribution of wealth, and there are strakes and lockouts



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WINDS and OCEAN CURRENTS

By

Frederick Fuglister

11 oods Hole Oceanographic
Institution

METEOROLOGY is the scene of the form and weather for cen turner mun has wondered where the wind comes from and where it goes. Certain things about the wind were castly observed for instance it was known that in some localities it would be from the southwest most of the time during the summer and that the desired was a summer and the sum of the southwest most of the sum of the southwest most of the sum of

the wind in midsummer might on any day come from any direction or there might be no wind at all

Men looked at the sky at the clouds and at the sun and moon for signs of what weather to expect If many times they saw a certain cloud formation before the coming of a strong northwest wind then naturally they associated that cloud form with that wind To people in all walks of life a knowl edge of what the winds are going to do has been of very great importance Will the wind that blows tomorrow be cold or warm? Will it bring rain or snow or sleet? Will it blow so hard that It damages crops and buldings? Refore answering any of these questions before attempting to forecast the weather, man had to answer one question What causes the winds to blow?

Before talking about the causes of the winds let us make sure that we understand all the words used in the explanation We can cover only a tiny part of the study of winds with this part of the science of meter tology, but even so we must be scientists enough to use our words accurately. To begin with



The tornede "twister" aver the ocean is called a water spout,

what is wind? It is simply air in motion and air is a metture of gases and water to por with very very small drops of water and dust floating about in it

Though the air actually moves in all di rections upward and downward as well as horizontally it is only the horizontal motion which we commonly call wind It is still ward strictly speaking when it goes up or down but these motions are called up-drafts and down-drafts The direction horizontally is always expressed as the direction from which the wind blows Usually the compass points are used. For instance a northwest ward as air coming from the northwest toward the southeast a south wind is one coming from the south and blowing toward the north When we wish to show a wind s direction on a chart we draw an arrow which points in the direction in which the win i is going

The motion of the a r is measured in many different ways such as feet per second or miles per hour as we measure the speed of a Car. or in knots as we measure the speed

of ships or with the Beaufort scale which is numbered o (representing calm) up to 12 (representing a hurricine). It is difficult to measure the exact speed of the wind since the air usually does not move steadily and the speed varies a great deal depending on how high off the pround it is measured.

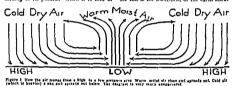
The primary cause of the wind is the hert which the earth receives from the sun This heat strangely enough dies not warm the art very much is it posses through on the way to the ground The air receives most of the primary that the primary that

When the pressure is high the air sinks an I spreads out across the surface of the earth It is this list movement of air across the earth's surface that we know as the winds

Must are a lighter than dry air, so we call an area that contains warm most air at a fighter than dry air, so we call an area that contains warm most air at a first and area of the air, the meteorole of the air, the meteorole gest uses an unstrument called the burmeler We generally refer to these pressure areas as smiph High of Log.

If you had at the Wind and Pressure Charts of the world pages 342 and 343 you will see that the wind-direction arrows point out of the high pressure areas and into the low pressure areas

But you will say why do the arrows curve? None of them goes straight from a High to a Low. You are right The reason for this is the movement of the earth about



the Northern Hemisphere it is warm in the Southern When it is day on one side of the

world it is might on the other So since the area heated is constantly, changing winter and summer day by day the difference in temperature between one place and another is also changing As we shall explain the changes in temperature cause the world to shift its direction and its speed. However in spite of their seemingly erratus behavior the winds on the average

do follow set parterns. When are is heated it expands. This means that the same amount of air takes up much more room when it is warm than when it is cold. Therefore any given amount of square foot for example of warm air weight less that it is the state of the same and the same amount of the same and the same amount of the same amount of cold air. This low pressure air these to the upper atmosphere and there spreads out. This in creases the pressure in the surrounding areas.

its axis. As the air mores from a high presure area to a low pressure area it is forced to the right in the Northern Hemisphere and to the left in the Southern Hemisphere This curring of the wind as It goes into a how pressure area is known as a cyclone of a cyclonic wind. The wind is a strong one if a cyclonic wind. The wind is a strong one if of air not from a High is called an anticyclone. You can see that in the Northern Hemisphere a Cyclonic wind moves in a counter clockwise direction and clockwise in the Southern Hemisphere. (Clockwise meanthe way the hands move on a clock, counter the way the hands move on a clock, counter

The word cyclone has two meanings. It is the name given lo certain tropical storms but for the meteorologist it describes the movement of air into a low pressure area and it may be a vollent storm or it may not conclumes a low pressure area is quite large



Figure 2. Wind in the Nathern Hemisphare 1) Arrows point out of high pressure into low pressure areas 2) The earth a rotation couses winds to curve (a cyclone) 3) Connece-clockwise cyclonic motion in Northern Hemisphe e

more than a thousand miles across in which case the winds may not be very strong

If the earth's surface were all one material (fit tweet covered with water for in stance) then the wind systems would be comparatively simple. Around the world at the Equator there would be a belt of low pressure since that area receives so much direct heat from the sun Both morth and south of this best there would be belts of high pressure because the warm rising air of the Equators would spill over incressing the Equator would spill over incressing the article and sub-natiretic there would be belts of low pressure with strong winds. And last there would be high pressure areas due to the cold at the two I oles The winds would.

then blow in the directions shown in Figure 3. The belts of low and high pressure would move north and south with the seasons north during the Northern Hemi sphere's summer and south during the win ter.

As a matter of fact since by far the great or part of the earth's surface is covered by water the wind six

tems are something like those on our imaginary water-covered globe. The northeast and southeast trades do blow consistently toward the Equator we do have a region of prevailing westerly winds. But the only one of these wind belts list extends completely surbout interruption around the world is the belt of because in this region the surface of the earth is entirely covered with water, except for the tip of South America.

During the summer months air masses that he over the land are much wremer than

those over the water (We have already said that the land radiates heat from its surface annulm more readily than the water. The sea abouts much of the heat and gives it back as a surface than that over the land. This seepically true where the land rate is large. So we have a relatively low pressure area over the land in summer and a High in winter. Consequently the winds blow onto the continent in summer and a way from it in winter. These winds are known as the monsoons. The best known monsoon is the one that blows across the Indian Ocean mone that blows across the Indian Ocean mone clone mensoon is often thought of as mean ing a volent storm, but the sort he case the monsoon is often thought of as mean ing a volent storm, but the sort he case the sum of the sort he case the sum of the sum of

The northeast mon soon that blows in winter across south ern Asia out over the Indian Ocean does not bring any rain and the winds are oute moderate.

This seasonal changing of tempera ture and pressure over the continents of course plays havor with our simple tha gram of high and low pressure belts We

WESTERLIES

HIGH

NE TRADES

HIGH

WESTERLIES

WESTERLIES

Figure 3. The regular pressure brits we would have

now see that there can not be any continuous belts of high and fow pressure around the world where the belts pass over both the continents and the oreans Because of this the pressure areas and their resollant winds break up and the patterns as you see them on the Wind and I ressure thatts 'to will notice that one the oreans the winds of the other than the patterns are winds of the mer. It is only near the land that the large changes take place with the seasons

There are two important things to remember when we study average wind charts First because of the small size of the charts many winds that are very important locally are not shown Every mountain every river has its own effect on the prevailing winds A chart may show southwest winds as the summer condition in a certain large area yet because of the lay of the land there may be a valley in that area where the summer winds are southeasterly 'The second thing to remember is that these charts show aver age conditions. That is the winds usually blow in these directions but not always es pecially not on the land areas. The trade winds which are or er the oceans can be expected to blow as indicated on the chart though they may be a little stronger one day than the next The westerlies in the south ern Atlantic are almost as certain and can be relied on to blow at gale force a good deal of the time during the winter

Let us now consider the storms or disturbances as the meteorologist refers to them A storm is a small traveling low pressure area. When it starts it moves very slowly gradually increasing its speed and size until it may be as large as eight hundred miles in diameter. When a disturbance has reached such proportions the winds are not nearly so strong as when the storm area was smaller The strongest winds are associated with the smallest and briefest disturbances For example there is the tornado of the United States which may last only a half hour, and measure only one thousand feet across but which does considerable damage even in that short time. The change in pres sure is very great in these storms and the air rises very rapidiy

The polar front as shown on the Wind and Pressure charts indicates where the cold air from one of the Poles meets the warmer tropical air. It is a constantly shifting front and it is along this boundary line that most depressions travel. The front does not always. represent a sharp change in temperature but wherever there is an abrupt change that is where a storm is most likely to be severe The polar front line on the Wind and Fres sure charts shows how the cold air moves down over the continents during the north ern winter and recedes in the summer.

On the Wind and Pressure charts you will find the names given to the major wind sys tems such as the trades and westernes You also will find the names given to those areas where there is rarely any wind at all the doldrums and where the winds are light and variable the borse latitudes. Not shown or named are the northers that blow across the Gulf of Vesico in the winter the tornadoes that usually occur in the upper Mississippi and Missouri valleys of the United States and the Santa Ana in California a hot wind that blows from the desert toward the Pacific Ocean There are hundreds of other winds all over the world many of them having very strange names such as the elephanta of India the williwaws in the Straits of Magellan and the southerly buster in Australia

The names that are most familiar to us are those given to the storms. The hurrons us a tropical storm that occurs in the western parts of the ocean near the Equator that parts of the ocean near the Equator that Atlantic Though we call this storm in the West Indies a hurronen the ones in the In dian Ocean are called cyclones those in the China Sea are called typhonics and the Aust Iralians who like unusual manes call the count the will by affines of their northeast count the will by affines of their northeast the story of the count of the story o

Almost 150 years ago a British admiral, Sur Francis Bernifort devised a method of quessing the wind a velocity. This instrument is still used on ships though it is not very exact. The Heaufort scale as it is called registers winds as shown below.

THE BEAUFORT SCALE

		THE PERCENT	IC ICI
Scale	Speed of 11 nd en Statute Mules	Description of Ward	Indications on Land
0 1 3 4 5 5 7 8 9	Less than 1 1 to 3 4 to 7 8 to 18 19 to 18 19 to 24 25 to 38 32 to 38 39 to 46 47 to 34 cc to 54 64 to 75	Calm Light Ar Slight Bireze Gende Bireze Gende Bireze Hoderate Bireze Froh Bireze Strong Bireze High Wind Gale Spong Gale Whole Gale Storm	Smole, goes straight up Smole drifts Leaves and mail to its are in motion Leaves and paper small benedes move Small trees now, married to mater Larse branches move umbrills are blown Whole trees move umbrills are blown Whole trees move walls og it difficult Twice brack off chimneys go Trees may be uprosted Lamage in wikepread
15	Over 75	Hurrwane [749]	Anyth ng may go

Sie

No one knows who the first ocean travel ers were. But whoever they may have been no doubt one of the first things they noticed apart from the huge quantities of water was that the water beneath them would often carry their boats from place to place even when there was no wind to blow them about Certainly the tides the rising and falling of the water along the coasts must have been known to man thousands of years ago And he soon found of he lived on a small hav or inlet, that when the tide was coming in he had a difficult time nutting out to sea in his tiny boat. So it was that he first learned of ocean currents. But it was many more cen turies before he realized that there are other and much larger currents in the oceans than those caused by the rising and falling tides

Tadal currents especially where they flow between land hanky more much more rapully than do any other of the ocean currents. But tadal currents are non-here near so large and do not Iravel so far as ocean currents. The speed of ocean currents can not be compared to air specifs. The fastest tadal currents rately more more than of moles an hour. This compared to known wind speeds of 150 miles an hour, is very slow indeed. Let for ships at sea even a current with a speed of one knot means something. The most interesting things about ocean currents however are the direction in which they travel and

the amount of water that they transport. The direction in which a current is moving is called the set of the current A northeaster's current is one setting or moving in the northeast. The speed of the moving with a continuous transport of the moving water is expressed in knots, and is called the drift of the current. Vanot is equal to one natured mile per how (about 2020)

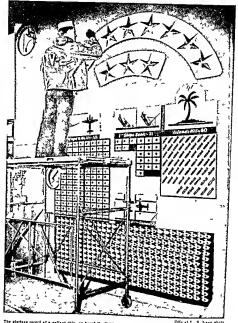
vards) There are three main causes of the ocean currents giving rise to three different types of water movement. The first is the attract tion of the sun and moon which causes the tidal currents. The second is the prevailing winds such as the trales and westernes which through friction set the water in motion. The third cause is the heat from the sun which affects the density of the water The differences in density from one place to another cause the water to move much as the differences in air pressure cause the winds Warm water is lighter, less dense than cold water. The density of sea water is affected not only by the temperature but also by the amount of disclored salts at comtains The more salure (salts) the water, the heaver or more dense it becomes If you will book at the chart of the ocean currents you will see the names of all the maper currents the arrows showing the di rections in which they flow. You will notice that most of the names given to the currents are simply the names of the constress by which they says as the Brazil Current the Cabiforns Current. One of the potable exceptions to this custom is the Gulf Stream. The name given this current brings up an interesting point.

It was named the Gulf Stream because it was supposed to come from the Gulf of Mer too, but observation has shown that it has three major sources—first the e auters from the Carbbean Sea which follow the shores of the Gulf second those Carbbean suters which flow directly by the north coast of Cuba and third the Antilles Current which form part of the Gulf Stream north of the Bahana Island.

We can not point to the beginning of any of the major ocean currents. The names we give them are simply for convenience in locating and pointing out the changing characteristics of the current patterns in the oceans. So the system of naming currents according to where they are or by the names of the countries which they pass is a simple

and convenient one Alf the major ocean currents carry vast amounts of water over long distances Since water temperatures change clowly corrents act as cooling or warming agents upon the land masses near which they flow depend ing on whether the currents come from cold or warm regions We call a current warm if its surface waters are warmer than the water through which it flows Actually il it is a deep strram a warm current may be carrying along extremely cold water well beneath the surface Freent for the tidal currents along the coasts very rarely does an ocean current reach to the fottom If the current is caused entirely by the wind it will be con paratively shall w. The deepest currents are those caused by changes in density of the water

The undone table currents receive their couries every ax hours or every twelve bours, depending on the ti-lal period. The offshore table currents constantly change their direction of flow and are often called noty, current. The currents called mon-woon didfits, raised by the moreson winds change their course with the assists. The root important are the northeast and south west monstoon defits of the Indian Ocean district of the contract with flower through the course with the assists. The root important are the northeast and south west monstoon defits of the Indian Ocean.



The gloriese record of a gallest ably on beard the light carrier Manbrey Fresh C. Sriveyer Polest Ind. of Philiodelphia is putting the lest, proof teach as the sale assertioned or battle schail, I'm Meetery was of the first mejor units of the Pavid. Series In every the control of the Series I may be series I may be seried in the Tech for the colliberation.



1945 Calendar

AWORLD at war became a world at peace before 1945 was torn from the calendar Mechanized Allied land armies in the east and the west crushed Germany between them with the aid of the most powerful air forces in history. Hitler's legions tottered even as representatives of the United Nations met in San Francisco to discuss an

organization for permanent world peace The unconditional surrender of pazi Ger many was announced on May 8

Japan alone fought on China made stronger by United States and fought back on the mainland American and British navies blockaded the Japanese main islands

In early August science threw its greatest weight into the war as an atomic bomb smashed the Japanese city of Hiroshima Nagasaki was destroyed as the second atom charge was loosed on Nippon Russia de clared war and attacked in Manchuria

The Imperial Japanese Government un conditionally surrendered to the Allies on

August 14

I eace became a reality and with it came many obligations Strengthening the United Nations Organization feed ng and governing conquered lands and changing industry back to percetime production were and are some of the world's problems

Fore gn affairs and national events, the

activities of armies and people of nations and individuals are all listed in the follow ing calendar of the year's headline highlights

Ian x France joins the United Nations Ian 3 United States First Army attacks northern flank of German salient in Bel gium -General Nicholas I lastiras organ izes new Greek cabinet

Jan 4 New American landings on Mindor) Island in Philippines are unopposed

Jan 5 The Soviet recognizes provisional government of Poland set up under Rus sian sponsorship at Lublin Ian 6 Turkey breaks off relations with

Tapan

Ian o Americans invade Luzon Island in Philippines land at Lingayen Gulf Ian 11 British representatives and leaders of Greek National Liberation I ront sign

truce ending civil war -- Germans forced back twenty three miles in Belgium

lan 13 Russians begin great offensive in Poland

Jan 14 Vazis withdraw to the Westwall Jan 17 Warsaw, Polish capital falls to

Soviet troops lan 20 Hungary signs armistice with the

Ian 21 Russians take Tannenberg gain in Inn 22 Ledo Road from Writkyina Burma

to Ledo India is officially opened Jan 23 United States troops capture St Lith Belgium

Jan 25 Russians seize Gleiwitz Germany 136 miles from Berlin

Jan 28 Americans retake Clark Field on Luzon Jan 29 United States forces enter Germany

near Oberhausen and Leterskirche - ew landing made on western Luzon Jan 31 Czechs recognize Polish Warsaw

government

Feb & Loundar declares war on Japan

Feb 6 teneral Douglas MacArthur an nounces fall of Man la Feb 7 Laraguay declares war on Vais na

tions
Feb 8 Canadians at d Brit sh start posh In

Feb 8 Canadians as d Brit sh start piech In Holland Feb 10 Americans take main Roer River

oam
Feb 12 Official ann incement declares that
the Big Three Rix sevent Churchill and
Stalin have met at Valta in the Crimes
Agreement has been reached in pringian
to crush Cerman and I mand wiftign.

Feb 13 Rus inn I rees ca; ture itu lapest Feb 15 T ks i la mbed 1 v 1 500 l mited

Feb 15 T ks is mbed iv 1 500 (mted states care or times
Feb 16 Americans land on Corregion in

Man la Bay

Feb 19 United States amphibines to applied on Iwo Jima 750 miles from Tokyo Feb 21 Inter American Conference on troblems of War and Leace opens in

Emblems of War and Teace opens in Mexico (it) Feb 23 Turkey declares wat on Germany

Feb 23 Turkey declares wat on Germany and Japan - Americans take Mt Suri bachi en Iwo Jima.

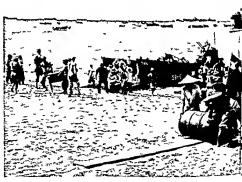
Feb 24 Fgy1 t declares war on \xis Fgyptrin prenier is assassinated—Argentina only American nation not in Luited \xi the offer of each not a furgical states

thas Organization as Uruguan jours
Feb 23 Americans cross Frit River and aptreach Cologne—Sauth Arabia and Iran declare war on Aus—Peypt and Turkey

in United Sathins

Mar 3 Finlin'l formally declares war on Germans

Mar 4 Aussians reach Baltic coast pear Kolberg Germany



7500

Landing supplies on the west coast of Luzen Philipples Inlands, tallowing brilliant action in Jacober [* 372]

Mar 6 United States troops capture Co logne Mar 7 Chinese clear enemy from Lashio.

Burma Mar 8 American forces cross Rhine via Hindenburg Bridge at Remagen fast ac tion prevents Nazis from destroying struc ture -Inter American Conference Problems of War and Peace closes at Mexico City Act of Chapultenec and

Dumbarton Oaks Conference indorsed Mar 10 Japanese seize control of Indo Chìna

Mar 12 Russians take Kustrin Oder River stronghold Mar 14 Royal Air Force announces bomb

ing of Germany with new eleven ton bombs Mar 16 It is revealed that giant German V 2 rocket bombs have been hitting Lon

don and southern England causing heavy damage

~3825

Mar 17 Japanese resistance ends on Iwo

Ima Mar 18 Americans invade Panay Island in Philippines without loss -Allied bombers blast Berlin in war s heaviest raid by day

Mar 20 Bruish take Vandalay Burma Mar 22 Delegates of six Arab states sign

final draft of constitution for new Arab League Mar 26 Americans enter Frankfurt and Limburg - Cebu Island in the Ph lippines

is invaded Mar 27 Argentina declares war on Ger

many and Japan Mar 29 Negros Island invaded by United States forces

Mar 30 Russians take Danzig Apr 1 United States Tenth Army lands on

Olinawa Island in Ryukyu group Apr 3 Siegen falls to American First Army Apr 5 The Soviet denounces non aggression pact with Japan -- General of the Army Douglas MacArthur and Fleet Admiral Chester W Nimitz to lead Army and

Navy forces against Japan Apr 7 Japanese lose six warships in sea bat tle fifty miles south of their home islands Apr o All es begin offensive in Italy --United States recognizes Argentina Gov

ernment Apr 11 Chile declares war on Avis - Spain

breaks with Japan Apr 12 President Franklin Delano Roose velt dies succeeded by Vice Preudent Harry S Truman

Apr 13 Lienna falls to the Russian arms Apr 16 Seventh American Arms enters nazi shrine city of \uremberg Hitler or ders last stand

Apr 18 Germany split in two is American Third Army enters Czechoslovakia Apr 10 United States troops take Leipzig

and Halle Apr 21 Soviet signs twenty year peace pact

with Warsaw I olish government Apr 22 Russians reach heart of Berlin

Apr 25 United Nations Conference on In ternational Organization opens at San Francisco forty six countries represented Apr 26 Bremen falls to British Stettin to

Russians Apr 27 Allies take Genoa in Italy Apr 28 Benito Mussolini former dictator

of Italy is executed by Lariisans in village of Dongo on Lake Como Apr 29 British Fighth Arms captures Mi



lan and Venice in northern Italy Apr 30 Munich falls to the Americans

May r German radio at Hamburg broad casts report of Adolf Hitler's death

May 2 Nazis surrender Italy and part of Austria 1,000 000 men lay down arms May 3 Hamburg gives up to the All es with out a struggle-British take Rangoon

May 4 Germans in Netherlands Denmark Helgoland northwestern Cermany and Frisian Islands surrender to British May 6 Germany signs m I tary surrender at

Re ms France May 8 \ E Day Germany officially surren

ders unconditionally at 6 of Par Fastern War Time May 9 Reich Marshal Hermann Goering

Field Marshal General Albert Lesselring and pupper Premer Vidkun Questing of Norway arrested as war crim nals May 10 Australian forces capture Wewal

I eninsula in New Gu nea May 15 Au tria abolishes all nazi laws and establishes prov sonal government -For mer nazi I ropaganda Minister I aul Jo-

senh Goebbels reported a su cide May 17 Jagosa Japan hit with fire bombs by soo B 29 Superfortresses for second t me in four days

Chinese take Hoch h in new May 21 Kwangsi Province drive

May 23 German General Staff dissolved Grand Admiral Karl Doenitz and aides seized-Heinrich Himmler former Ges tapo chief commits suicide after capture May 24 More than 500 B 298 from the

Marianas Islands bomb Tokyo May 20 Yokohama pounded by 450 Super

fortresses June 4 All es announce terms of B g Four agreements setting up Allied Control

Council to exercise supreme authority over post war Germany June 6 Brazil declares war on Japan June 7 King Haakon VII of Norway returns

to Oslo after five years of exile June 11 Australians invade Borneo at four

points in Brunes Bay area June 15 Joach m von Ribbentrop former nazi Foreign Minister is captured in

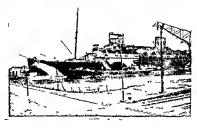
Swedish hideout June 10 Lieutenant General Simon Bolivar Buckner commander of all land forces on

Okmawa is k fled in battle June 21 Organized Japanese resistance on



A ship the Cormans did not dare to send is sea during the bustilities— the luxury liner Europa dotked at Bremerhaven

Official U S Navy rhoto





Canad an A my photo Canadian anginents at work floating acctions at a Bailey Bridge late place on the Rhins

Okinawa comes to an end

June 26 United Nations Conference ends at San Francisco after sixty three days with delegates from fifty countries sign

ing new world charter June 27 General Mac Arthur proclams full liberation of Luzon Island in I hippines -Secretary of State Edward R. Stettimus

June 30 James F Byrnes 15 named Secre tary of State by President Truman July 5 Conquest of the Philippines is com

pleted July 6 Nicaragua becomes first nation to ratify United Nations Charter

July 7 Pelish Soviet trade pact signed in Moscow July 10 Record land and carrier plane raids

rip Japan

July 17 Churchili Stahn and Truman be gn Big Three Conference at Potsdam Germany

July 23 Marshal Henri Philippe I étain goes on trial for treason in Paris.

July 24 United States carrier planes attack Japan's greatest naval base at Kure Hon shu Island

July 26 Winston Churchill replaced as Prime Munister of Britain by Clement Att lee-President Truman announces joint United States Britain China unconditional surrender ultimatum to Japan This Potsdam Ultimatum outlines Allied policy

for Japan July 28 United States Senate ratifies United Nations Charter

July 31 American destroyer force shells Shimizu Japan's most important alumi num production center

Aug 2 Big Three parley adjourns at Pots dam fifteen page report on agreements reached is released

Aug 4 President Truman s gns Bretton Woods legislation United States first to Ianan

approve world bank and world fund Aug 5 Atomic bomb smashes Hiroshima,

Aug 8 Second atom charge loosed on Japa nese city of Nagasaki -Russ a declares war on Japan effective August 9 - Presi dent Truman signs United Nations Char

Aug o Russian offensive begins in Man churia

Aug 10 Japan makes h d for peace agrees to accept I otsdam Litimatum if Emperor Hirohito is permitted to retain his throne Aug 11 Allies agree to let Emperor retain throne if he will submit to authority of

Supreme Allied Commander in Japan Aug 14 Japan surrenders unconditionally fighting stops

Aug 15 Petam condemned to the for trea son sentence changed to hie imprison ment by General Charles de Caulle Aug 19 MacArthur aides meet Tokyo sur

render mission in Man la

Aug 26 Russo Chinese pact signed on Aug 14 calls for mutual aid through Chung king Government Chinese Communists to get no aid

Aug 27 First American airborne troops land in Japan at Atsugi airdrome sixteen miles southwest of Tokyo

~34:-

Aug 29 Four power War Crimes Commis sion releases names of twenty four nazi war criminals to be tried at Nuremberg Aug 31 United States and Finland resume

d plomatic relations Sept 2 V J Day proclaimed as Japan signs official surrender terms aboard battleship

Missouri in Tokyo Bay (Surrender took place on September 1 United States time) Sept 4 American flag waves again over

Wake Island as Japanese lay down arms Sept 8 Tolyo officially occupied by United States troops -- r 000 000 Japanese give up in China, Formosa, Indo China and the Lescadores

Sept 13 Imperial Japanese General Staff dissolved

Sept 19 Prime Minister Atilee of Great Bretain pledges self rule for India Sept 25 Natives of Annam revolt against return to French rule

Sept 29 Foreign ministers in London an nounce mutually satisfactory plan for es tablishing policy necessary to carry out Japanese surrender terms, United States to lead Far Eastern Advisory Commission Oct 2 Annamese revolt against French in



The Post Office at Riel, Germany after a Leyal Air Force raid. Many raids were needed to put this Soitic pers



Offic at U S Ma ne Corps pho o

At high! the skies over Ohinawa glowed with the Each of projection from the wespons of the Japaness and the Marines. In the battle for this joined the United States suffered the pearlest laces of the Pacific war

Oct 3 Russia refuses to join Far Eastern Advisory Group unless four power control council for Japan is established

Oct 4 Indonesian nationalists in Java seize cities of Surabaya and Bandung in protest against Dutch rule

Oct 6 New Japanese cabinet organized with Baron Kijuro Shidehara as Premier Oct 8 President Truman says the United States will keep the atomic bomb secret

Oct 10 United States invites representa tives of nine governments to Washington on October 23 for Far Eastern Advisory Commission discussion -British and Rus sian troops to leave Iran -- France and Britain sign pact recognizing French

Oct 15 Former French Premier Pierre La val is executed in Paris as a traitor after suicide fails

Oct 16 United Nations Food and Agricul

ture Organization holds first session at Quebec Canada Oct 10 Far Eastern Advisory Commission meeting postponed in Washington as Rus

Oct 20 Outer Viongolia votes to cut all ties with China and become independent republic

sia fails to accept invitation

Oct 21 French vote approval of General

Charles de Gaulle's plan to draft a new

constitution Oct 23 \idkun Quisling is shot as a traitor in Norway Oct 24 The United Nations Organization

is a reality as the Union of Soviet Social est Republics becomes the twenty ninth country to ratify the charter Oct 28 Chinese Communists report clashes

between their troops and Chungling Na tionalist armies in eleven provinces

Oct 29 Getulio Vargas resigns as president of Brazil replaced by Supreme Court Jus tice Jose Linhares until coming general elections

Oct 30 First meeting of Far Eastern Advis ory Commission in Washington votes re cess for week Russia still absent Nov I United Nations Food and Agricul

ture Conference ends in Quebec with an appeal for constructive world action

Nov 2 United States recognizes the provi sional governments of Hungary and Brazil Nov 5 I resident Truman opens a labor management conference in Washington

with eighteen delegates from each side in attendance—Hungary has first popular election in its history Small Landowners party wins over the Socialists and Com munists

RESCUE IN THE WAKE OF VICTORY





5 gmal Corps photo most femous prisoner of wor-General Jonethan M uwright heggard but smiling after being rescued thren long years of Jopenese imprisonment.

Nov 6 Indonesia rejects the Netherlands offer of empire status full independence is revealed as chief objective

Nov 7 Arabs kill seventy four lews in Libya troops restore order -British jet propelled airplance flies record 606 miles per hour

Nov 8 British warn Indoesians to disarm or face attack - Tripolitania rists rage

Nov o United States and sixteen other countries meet in 1 aris to discuss German reparations

Nov 10 Prime Vinisters Attlee of Great Britain and king of Canada arrive at Rashington for atomic bomb control dis-**Eussian**

Nov 11 Planes blast Java naval base of Surabaya as British advance against Indo nesian nationalists

Nov 12 Former United States Secretary of State Cordell Hull awarded Vobel Peace Prize for 1025 International Red Cross for 1944

Nov 13 President Truman agrees to joint inquiry with British on Palestine issues -Tally of Yugoslavian ballot held on No vember 12 finds sweeping victory for



Offic at Mer ne Corps pho o

Leathernecks weding towards the shore line of the Land of the Rising San to assist in the occupation of Japan.



Varshal Tito s regime -General Charles de Gaulle unanimously elected interim president of Provisional French Govern ment

Nov 14 Russia again asks for veto vote in Japanese Control Council

Nov 15 President Truman and Prime Ministers Attlee and King announce in Washington that atomic bomb secret will not be shared until the United Nations

Organization devises a control plan Nov 18 Bulgaria holds first general election since 1940, Fatherland Front party wins -Revolt reported in Azerbaijan province of northwestern Iran

Nov 19 Chinese Nationalists drive forty miles into Manchuria-Iraman troops move to halt rebels in Russian occupied province of Azerbaijan

Nov. 20 Nazı war crimes trial starts at Nuremberg Germany-General of the Army Dwight D Eisenhower appointed Army Chief of Staff Fleet Admiral Ches ter W Nimitz made Chief of Naval Operations -A B 29 Superfortress smashes

seven year record by flying 8,198 miles

non stop, Guam to Washington D C Nov 21 The United Automobile Workers of America strike against the General Motors Corporation .- General Alexander Patch,

leader of the United States Seventh Army in Europe dies at San Antonio, Texas Nov 22 Chinese Nationalist troops out flank south Manchurian port of Hulu

tao Nov 24 General MacArthur imposes severe

tax on all Japanese wealth Nov 25 First Austrian general election in fifteen years indicates defeat for the Com munests in an overwhelming Socialis

victor Nov 26 United States proposes that the Big Three remove all troops from Iran by January 1, instead of March 2, action

urged to calm fears of small nations Nov 27 Major General Patrick J Hurley resigns as United States Ambassador to China, denounces State Department pol icy, replaced temporarily by General of the Army George C Marshall

Nov 20 Surabaya falls to the British after nmeteen-day battle -- Monarchy ends in Lugoslavia

Nov 30 Labor Management Conference closes in Washington after little success Dec 2 Brazilians cast first presidential vote in fifteen years General Eurico Gaspar Dutra is elected -Albania votes in na tion's first free ballot Democratic Front.

wins by large majority

Dec 3 Russia rejects United States proposal to leave Iran by January 1

Dec 4 Alcide de Gasperi named Premier of Italy by Prince Humbert Lieutenant General of the Realm

Dec 6 Lieutenant General Tomos uki Yam ashita convicted as was crim nal in Man la will de by hanging -- United States and



Great Britain announce signing of a new I am agreement whereby the United States will lend \$4.400,000,000 to Freind

Dec o General George S Patton Ir seri cusly injured in automobile accident at Mannheim Germany - General Mac Ir thur orders Japanese Government to submit plan ending feudal farm system

Dec to RAF planes destroy Indonesian village after ambush of British convox Dec 12 Chinese Central Government trootes

enter Manchurian capital of Mulden no Communist opposition

Dec 13 lintain and France conclude agree ment on Syria and Lebanon, all troops to be withdrawn December 21

Dec 15 United States chosen as permanent home for the United Nations Organization Dec 16 Big Three f reign ministers open nicetings at Miscon - Chinese Commu

nists in Chungking to discuss peace Dec 17 United States Supreme Court stars execution of General Yamashita

Dec 10 I resident Trumin nominates former Secretary of State Edward R Stermous

delegates nominated are Secretary of State Junes I Byrnes, Senator Tom Longally Senator Arthur II Vandenberg and Mrs I Jeanor Koosevelt Dec 20 Dr Karl Renner, Socialist, is elected president of Austria

as principal United States delegate

to the United Nations Organization Other

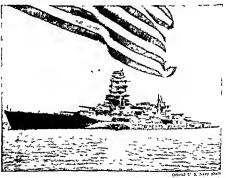
Dec 21 General George S Patton, Ir., dies

at He leiberg Germany Dec 22 United States and Great Britain recognize the Yugoslavian Republic

Dec 23 Pune Pius \II announces names of thats two new cardinals, for the first time in history every continent will be repre-

sented in the College of Cardinals Dec 25 French Government announces devaluation of the franc-

Dec 27 Big Three state conclusions reached at Moscow conference of foreign ministers international control of atomic energy agreed upon Russia gets veto vote in languese affairs - Twenty-eight nations sign Beetton Woods Monetary Pact at Washington Russia absent







N w Yo k Zoo g 1 Soc



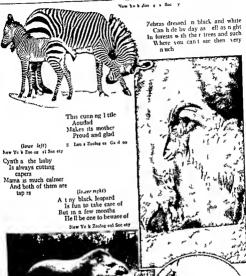
Wh sper ng secrets
To is mama

This tiny baby monkey

Find out whom that face Belongs to

Baby kangaroos dona fuus Abouta Atolley or a bus But r de where er mama goes— Rather bumpy I suppose





I ist like a pig!



[866]





This hade we at us is a far partic by Rap by seen there the arrests of the stoffage parting The settle of Meantti e was presen when Mean Shaw parted to settle I sha he shout a quart s sa he [368]

FINGER-PAINTING



Two youthful dager painting experts Finger painting ap peals to young people and to their olders too

NOT so very long ago in a school for American and British children in Rome Italy a little boy cut his finger His teacher an American lady called Viss Ruth Fason Shaw told h m to go to the bathroom and put some sodine on the cut The little boy did as he was told Then he happender to run his solding starred lines to run his solding starred lines to run his solding starred lines to the bathroom and the starred lines are the solding starred lines the produced what seemed to him to be a very pretty kind of pattern

Now many generations of children have loved to make picture and designs with heart fingers—in sand and mud on the dest that settles on further on frosted windows that settles on further that the first fine of the little by the continue with his older for the little by to continue with his older decoration of the bathroom door. He found his task so pleasant that the time passed very quickly. Finally his teacher decided to see what was keep ng imm so long When she entered the bathroom she saw the boy's masternece on the door.

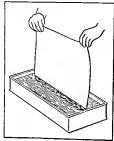
Since Miss Shaw was a wise teacher she did not become any She realized that the boy was doing a perfectly natural thing he was simply expressing himself artistically fall fact she suddenly realized that finger painting offered many executing possibilities would it not be an ideal artistic activity for young children who lack skill in handling brish and pencil?

So Miss Shaw decided to perfect a paint that would be suitable for this purpose It would have to be non poisonous, because

children might absent mindedly put their paint stained fingers in their mouths. After much experimenting Miss Shaw finally created a paint which looked like jelly and felt like solt mod. With this material children could paint away to their heart's content with perfect safety to themselves and to their clothing as well

It was in the year 2532 that Miss Shan It was in the year 2532 that hiss Shan perfected her finger paints. In the following year she brought them to the United States. The art of finger painting the history in from that time too his summer camps in activity in schools that it is now a lavorite activity in schools homes Although it was first created for young the life in this sat first created for young the life in this sat if set created the control of the control of presented and states of the control of presented artists. In World War If finger pushessional artists In World War If finger and USO (United Service Organizations) clubs and in hospitals maintained by the armed forces.

In this sattled we shall tell you how you too may be part in this facenating active yourself with the paints have figer painting as special set of as the set could be special set of as the set could be supplyed in a special set of as the set could be simple ment used not paint as a summary of the set of paper cost \$5.20 those with six \$4 parts of paint and twelve for sheets of paper cost \$5.40 the set of the part of the set of paper cost \$5.40 the set of the parts of paper cost \$5.40 the set of paper cost \$5.40 the set of paper cost \$5.40 the paint parts and paper may also be bought singly. There are as a color



Row the wet paper should be removed frem the pan.

in all—sellow red blue green brown and black As we have pointed out the paints are

harmless when swallowed though of course they are not meant for swallowing! They are harmless to the slin They can be washed off the hands or arms with water If the paint gets on woolen clothing it may be brushed off when it dries If it gets on cot tom material it will come out if the material is soaked in cold water and then dipped in warm scap such

In addition to the punts you will need a wooden spatula for each jat The paper on which you are to paint comes in sheets in discless 17th paper has a special glaze on one aide the other side is plann IR punting is to be done on a table with a process of the paper has been also been a proposed to the proposed to the proposed to the proposed to the paper been considered in the paper been approached to the paper been appr

fore working with it you should provide yourself with a pain more than 1 of inches long An ordinary sank will do just as well if you can set up your working table near it you should also have a small boat or pain in which to wet your hands while painting and a bucket of water for washing your bands and arms and for cleaning the spatial see when your painting is finished. You like you have you manufus; if finished You like you have you manufus; if finished You

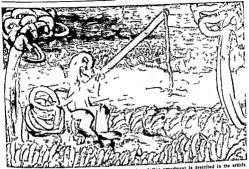
should lay in a surply of newspaper or sheets of rough cardboard larger than the paper on which you paint (As we shall see the newspaper or cardboard is to be used to drying purposes) Finally you should have paint rags any clean rags will serve the purpose

We are now ready to paint. First we make some that the surface of the table on which we are to work is perfectly clean. Then we have our arms to the cllows ann. as far above the ellows as possible. Next we take a sheet of paper and roll it must be form of a cylored with the surface from one of the short odes under the configuration one of the short odes with the surface from a sink. Then the total of water or into a sink. The document of water or into a sink. The surface is the surface of the surface as shown on this page.

of the water as shown on this page. We put the paper glazed surface up on the table. With one hand we smooth out winkles and air bubbles with the other wift the edge or the corners of the paper to ket the air escape. We now velect one of the colors in the paint parts before us. With a spatial we dep out a quantit equal to a tablespoonful and put this upon the paper. Wetting our hands we street he color our the color of the colors.



g artist to using all the flagers of his fift miace the effect that he wasts, Very the made with the fingermatic.



The Fisherman This painting was done by the little boy whose tedine experiment is described in the article

the sheet of paper and with the flat of the hand we work away at the blob of paint until it has been spread evenly and smoothly over every square inch of the surface of the paper

In panting you are to use your palms, the sale of your hands your finger tups your finger mais, your knuckles your islumbs even your forearms. Work with thythrical muscular movements of the whole body do hol be afraid to let yoursel go Never mand about producing a masterpiece at first Just work away with all the natural brushes that we named above and see what effects you can produce Experiment and make discoveries. If the paint becomes dry, a few drops of water should be sprinkled on it. Wet paint gives better contrasts and more pleas ag tetrures than dry paint.

Here are some useful hints. The back known and far away things should be done first they should be tarred at the top rather than at the bottom of the paper. For amonth background cover the paper was well as the should be a super to the en vertical or horizontal strokes applied with the flat of the hand the forearm may

also be used for this purpose

Use your thumb for stems and flowers
pat the paint with the side of the hand for
foliage use the fingernails for fine lines or

grass To make a part of your painting light er, apply pressure as you move your palm over the paper You can stroke out details with your fit gernails At any time you can rub out what you have done by moving the

and of the hand over the paper.

Our may pannt with one color or with more than one it is advisable however, the work in one color until you become families with the technique of finger painting, may be blended by putting out top of the other and then rubbing say until you have the deserted not of the painting by with the part of the painting by with the part of the painting by with the part of the painting by with the painting by the painti

You will be amazed at the number of subpects that lend themselves to finger panting. You will be able coeste all sorts of imaginative and decence patterns. You will be able to more thanking to the constraints of the able to more three and flowers mountains and constructions that the subance of the ocean the faccunating regions that he beneath the surface of the water Some people have even done excellent por traits with finger paints.

When you have produced a painting with which you are satisfied the next step is to

dry it Lift the paper up by two corners and place it, painted side up, upon a newspaper or a piece of rough cardboard larger than the naming itself. It will take about two hours for the painting to dry When it is entirely dry, run a hot iron over the back of the paper This is done in order to smooth out wrinkles and to prevent the edges of the

paint on it, use a paint rag to rub off the paint Also wash the spatulas that you have used and replace the screw tops on the jars of paint Finally wash your hands and arms (and face, if necessary)

Finger paints may be used to decorate a number of different objects. You can put beautiful designs on wooden articles-trays,



paper from curling The paint will not rub off or peel unless it was not worked in smoothly in the first place

The dried painting will be in a permanent form-that is, unless you apply water to the painted surface You can easily make the painting waterproof by giving it a coat of clear shellac If you wish to Leep a collection of your paintings, write your name and the date in lead pencil on the plain side of the paper before you begin to work with it In this way you will be able to trace the progress that you have made

When you have finished painting, wash the table top so that there is no trace of

telephone screens, book ends and unpainted furniture The best effects are produced on soft light-colored wood Be sure to work the paint in smoothly Paint toaks into the wood as it is worked Therefore, in order to get pure color, it should not be worked over too often By applying shellar, you can make any finger painted wooden surface washable

In making desk sets, blotter covers, port folios and scrapbook covers, cardboard can be used as a base on which to paste finger painted paper, or else the painting can be done directly on the cardboard. The edges are more attractive when bound with black or colored passe partout. (Passe partout is a

s rong gummed paper, used especially for

mounting pictures)

Finger painted wastepaper baskets are very attractive. Make the pattern and trace the outline on cardboard Paint directly on the cardboard. When the paint is dry cut

out the basket Passe partout can be applied along the edges if desired Join by lacing through punched holes or by means of brass fasteners.

It is interesting to note that while finger painting for beginners is something quite new the use of one 8 fingers and hands in applying ordinary paints goes back several hundred years. This type of painting was developed in China by a Lamous artist called Kao Chi pei who died in the year 1739 Ac ourd go to the story. Kao used to paint with brukes I ke all the other artists of his day He became 50 successful that he could not find time to finsh all the paintings that rich that the could not find time to finsh all the paintings that rich

patrons ordered

ame into One day one of he e t atron haos studio and told hin that hin ust finish at once a painting tha h pai n that dered has repled 1 k 1 led n if he insisted on having a l w u lha e such a very short time the t g (ut to work with h s f ngers \1 1 k his paints and began to ai ply the fingers To his surprise he p odu masterp ece which the at s Da and the general public too great ad

Many of kao s pattons to having the artist do finger painting fird too It is said that in the course of the ka abandoned his brushes sliegother and used only his fingers in his painting A number of Chinese artists have the sliegother and used per painting since kais day. This Chinese art is called finger tip painting the painting the paint used is like an uning. The paint used is like an uning. The paint we do not be rubbed out and painted over and over until the result is satisfactory

CHARADES

A CHARADE is a puzzle the solution of havinch is a word of two or more sylla blue Each syllable is given to the solver by means of a description or by acting out a keen. By putting the syllables together you will have the desired word. For example suppose you have the following descriptions. "My first (that is the first syllable) is a beast of burden my second is a place of hearn any the syllable is a place of the syllable in the syllable in the syllable is a place of the syllable in the syllable in the syllable is a place of the syllable in the syllab

Can you solve the following charades? They are really qu te easy If you can not sees the first syllable try the second it may give you the necessary clue to the word. The answers are given upside down on page 374

I My first is a place where travelers stay
If you have my second you're very
wise

You'll find my whole where people pray Its fragrance rises to the skies

Wy frst is never short My econd has many a port My third is neither a woman nor a child

- My whole you'll find when goods on docks are piled
- My firsts a favorite fish that's found right off the coast If you do my second you have no cause

to boast My whole is pleasing in the noonday sun But sometimes when it's cast our joy is

4 You use my first to make the things you eat

You sometimes climb my second to fill my first My whole arranged in rows in order

neat
Contents the appetite and quenches
thirst

5 On my first you ll take a ride
With my second by your side
When you come home unfeeling soul
I fear you il trample on my whole

6 My firsts a tiny creature busy as can be
My second a famous boat in days of

old

Wy third on many a cot or bed you'll see

Wy wholes a place where you can t

shun the cold

7 My first belongs to womankind My second guards you well from cold My whole I in very sure you il find Always alone and often old

8 My first is oft a stone My second s one letter alone My third is you and I My whole will make you cry

HOW TO TELL A PERSON'S AGE

WE are going to begin by giving you what seems to be an ord nary table of figures. As you see there are six columns

of figures in the table the numbers range from 1 to 63 and they follow in order in all three of the columns

		4	8	15	
3		:			32
ž	ž	ş	10	17	33
5	7	ž	11	18	34
6	10	12		19	35
ıí	11		12	20	35 36 37 38 39 40 41 43
13	14	13	13	21	37
15	15	14	14	22	35
17	48	15	15 24	23	39
19		20	24	24	40
35	19	20	25	25	41
23	22	22	26	20	43
25	23	13	27	27	43
-33	36	28	18	28	44
27	27	29	29	20	45 46
*9	30	30	30	30	46
33 55 37 59	31 34 35 38 39	31	32	31	48
33	34	36	40	48	48
33	35	37 38	41	49	49
37	36	38	42	50	50
41	39	39	43	51 52	31
	42	44	44	52	52
43	43	45	45	53 54	\$3
45	40	46	46	54	2.2
47	47	47	47	55	54 55 36 57 58
49	50 51	53	55	56	16
51	51	\$3	57	57	57
53	54	54	58	\$7 \$8	15
55 57	\$5 \$8	55 60	59	59	20
57	58	60	60	66	62 60 89
59 61	59 62	δį	61	61	61
63	63	62	62	62	62
43	63	63	63	63	63

Yet this is no ordinary table for with it you will be able to tell the age of any person from one to sirtly three years old—quite a range of ages with which to work.

This is how you was the stall of

This is how you use the table Suppose that you want to find out the age of a friend Show h in the table of figures and ask him in which column or columns his age is given Then add up the figures at the top of these columns and you will have the annwer the tuns take a definite example Mr. Jones who is 25 years old will tell you that his age is lated in the first fourth and fifth columns. The figures at the head of these columns are 18 and 16 Added together they give 25 that is Mr. Jones's correct age.

ANSWERS TO CHARADES

(4) Fanty (pan tree) (5) Carpet (car)
per) (6) Antarcise (ant ark trek) (7) Her
max (her smit) (8) Piteous (pit e us)

Hore are the arswers to the character (s) (4) (4) Horensales (1) Horense (nn sense) (2) Shadow (shorters aron) (3) Shadow (shorters aron)

HOW TO MAKE AN

ELECTRIC. MOTOR

WE are going to show you how to make an electric motor that is designed to operate from a single dry-cell battery It is made from nexpensive materials and is quite easy to build If you follow instrucwill really run At the same time you will have learned just what makes your motor

MATERIALS REQUIRED Figure 2 shows the materials that you will need They ınclude

- I wood block 25/4" x 45/2"
 t wood block 4/4" x 6"
 (Both block 3 should be cut from soft pine wood
 preferably 3,4" tuck. Grain of wood should run
 with the longest dimers on of each piece 1
 115/2" length of 5/4" thick x 3/4" wide soft from
- (stop steel) 1 134" length of same from as above
- 1 16 penny common spike nail (sron)
- 4 penny common spike man (wow)
 4 penny common sais (iron)
 2 to 8 1½" long round head wood screws (iron)
 to length of 4/" wide friction tape
 16 length of common wrapping string
- 1 /2 lb Coil No 18 Bell Wire (annunciator wire)
- 75 all in one length
 1 152 volt dry-cell battery (No 6 preferred)

BASE The large wooden block is used for the base of the motor and requires no further

BEARING BLOCK The bearing block should be made from the small wood block as shown in Figure 3. The notch in the bot tom 34 wide by 36" deep should be just large enough so that the iron can pass through the property of the property through



FIELD POLES The long piece of iron is to be bent to the shape shown in Figure 4 First find the center of the iron and mark a line with a pencil 11/2 each side of the center. The part of the iron between these lines will form the flat 3 section at the bot tom Then bend the iron between the two pencil marks and the ends of the iron keep ing the dimensions as close as you can to those in the diagram

You can bend the iron with a hammer on a block of wood or else you can put the fron in a vise, and use a monkey wrench forming the iron around a rod or pipe The bent iron need not follow the pattern ex actly However the space between the poles (the ends of the iron) must be two inches and each pole must be two inches from the hottom

ARMATURE IRON See Figure 5

ARMATURE SHAFT The spike to be used for the armature shaft should be per fectly straight Remove the tool marks from the head with a file or with emery cloth Also remove any arregularities or enlargements near the point of the spike

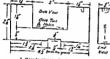
ASSEMBLY The field pole iron (the long bent iron) is to be set in place in the notch



2. Malerials required make the electric motor

on the underside of the bearing block. Then the bearing block is to be attached to the base by means of the two No 8 wood screws (See Figure 1) Two 4 penny nails are now to be driven in the base, 1/2 from both the iron and the bearing block as shown in Fig. ure 6 Note that these nails are on the side of the field pole iron that is nearer the point of the spike

Next we make the armature bearings These are hollowed out places in which the spike containing the armature from will turn First lay a spike across the bearing block so that it will be in the exact center then mark the location for the head and the point of the spike (Note The field pole iron is closer to one bearing than the other The



3. How to prepare the bearing block

head of the spike must be on this closer bearing) Heat the spike and burn in the head into the block. Do the same with the point end, repeating the process until the spike has burned a bearing as deep as the diameter of the spike Rotate the spike while burning After burning, add a few drops of light oil Figure 9 shows how the bearings will look when your task is completed

WINDING THE FIELD COILS, With the field pole iron in place, wrap the places where the coils are to be located with friction tape (See Figure 6) An 18" length of tape is required for each pole. At each turn

the new layer of tape must cover one-half of the last laver

We are now ready to wrap the wire (No 18 Bell Wire) around the taped part of the iron Allow 12" of wire for the battery lead -that is, the section of wire that is to lead from the field pole iron to the battery After you have measured out the 12" of wire, start at the base on either pole, wrapping the wire in a clockwise direction (See Figure 7) Lay each turn as close as possible to the preceding one, continuing to within 1/2" of the top This should take about 40 turns

Before the last three turns are applied at the top put a r" length of tape under the wire, folding the tape back over the windings



when the return layer is started Add the second layer, laying the turn as closely as possible until you reach the base again. This should take about 36 turns Lay on the third layer up, and the fourth layer down Each will take about 30 turns, making a total of about 136 turns It is not necessary to have exactly 136 turns, a few more or less will do no harm

After completing the winding process, leave 12" of wire-the finish wire, as it is called-and cut off the rest. The finish wire should be wrapped around the 4 penny nail which has been driven into the base, 1/2 from both the iron and the bearing block This nail serves as a brush holder, and the end of the ware, with the insulation removed, forms the brush The brush should point upward, as shown in Figure 8

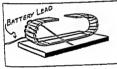


f How tape to wound around the Sold pole from

The winding for the other pole is applied in a similar manner, allowing a 12" batters plead and winding in a clockwise direction. The finish wire, 12" long is to be winped around the other 4 peany nail, the bright part should point upward. The two hirsts are spaced about 3% apart at the will book after the winding is completed with the brushes in place and the batter; leads connected to the terminals of a battery.

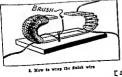
PREPARING THE ARMATURE We are going to prepare now what it called a two pole armature First drive the spake through the bollen in the armature con (Fig. 1975). The spake through the bollen in the armature con (Fig. 1976) which was the commutator of a 1977 from the armature rom Next we make the commutator At a distance of 3577 from the head of the spake, wrap four layers of 377 winder fretton tape around the spake

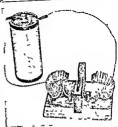
We now make the bars for the commutator (Figure 10) The two bars are made of



7 Wrapping wire around the taped park

a single 3" piece of No. 18 wire, which is prepared as shawn in B. Figure 11, by means of a pair of long nose piers. Then the wire is bent and set on the commutator, as shown in C. Figure 11. Note that the two bars are opposite each other on the commutator, also that the central part of the wure is bent back so as to clear the spike. The bars should be





The field pote tren siter winding is completed

located on the commutator so that they are in line with the leading edge (the longer degle) of the armsture iron as shown in Fig ure 1 The bars are kept in place by means of string as indicated in Figure 10. Their overall diameter should be % armsture is in the position allown in Figure 1 the brushes should make contact with the bars

HOW TO START THE MOTOR. Con nect the battery leads to the terminals of a dry-cell battery and give the armature tron a turn or two by hand This will start your motor going and it will continue to run as



long as you have it connected to the battery More than one dry cell can be used if they are connected in series the motor will run faster and will be more powerful. You will be able to operate toy machines with it by using a rubber band for a belt

WHAT MAKES THE MOTOR RUN?
Suppose that the brushes of our motor are
making contact with the commutator bars
as shown in Figure 1 As the electric current
passes through the coils of the field pole iron, it
ts becomes a magnet. The north pole of this

magnet will be opposite the north pole of the armature iron which will also be mag netized. Since like poles of magnets repeleach other, the armature will start turning

As the armature moves the brushes love contact with the commutator bars the cruit is broken and both the field pole iron and the armature iron love their magnetism since no current is passing through the coils. But the promentum of the armature keeps

at turning until the brushes make contact again with the commutation bars. Again the field iron and the atmature are magnetized grain like poles are brought into contact and repel each other and the armature continues to turn. This process is repeated as long as the electric motor is connected to the bat

Article and illustrations prepared by the West

A USEFUL BOOKSTAND

Till bookstand described in this article is quite easy to make Figure 1 shows how it will look when it is completed higher 2 mer 2 mes the necessary working drawing. The dimensions of each part of the book stand are given in the drawings If you would like to have a smaller or larger stand change the dimensions accordingly.

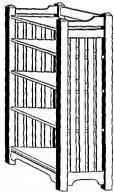
You may use a hardwood like oak beech or birth for the bookstand. However, such woods are rather difficult to work. A soft wood such as pine or spruce is easier to handle. After the stand is completed it may be stained to juntate any of the more expen.

sive and harder woods

The first thing to do is to cut out to the exact dimensions the various pieces of wood required for the stand. These pieces will include the four legs the rails or crosspieces connecting the legs five she'ves eight slats four on each side. After cutting the pieces finish then carefully with a plane so as to have them smooth and true. Then rub them with sandopares.

The legs must be strong the finished size should not be less than 1 ½ inches Earls side piece is to consist of four slats fitted into the side ruled by means of sides cut into the rails. The shelves and rules are to be fitted into the legs of the bookstand by means of inorties modes are cut in the legs with a change to a the reds of the shelves and rules are cut so as to fit into these holes. Figure 3 shows the principle of motive-and tenon construction

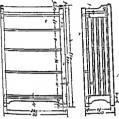
When all the gueen has been prepared, we should first put together the side pieces, consisting of the slats and cross rails. The slats are fitted into the appropriate slots after the parts which are to come into contact have been given a thin coat of wood give When you have finished a side piece.



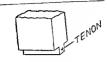
I This Is the besketand described in the article Warking drawings are given on the next page

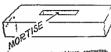
place burlap or a similar material around the top and bottom rail so as to protect the fin rsh. Then wrap cord around them in order to keep the various parts of the assembly under pressure until the wood glue has bad a chance to get

When the side pieces have been com pleted you are ready for the final assembly Vortises and tenons should be conted with wood glue before being set in place When the assembly has been completed keep it under pressure until the glue has set



king drawings to be used in making the book Left front view Right alde view





3. Details of mortise and tensa enstruction. If you have used a soft wood it may be

stained any appropriate color Mahogany rosewood walnut and ebony stains are all very effective Give at least two coats of the stain which is to be applied with a brush If you wish to give the bookstand an extra fine finish you may apply French polish after all is dry When the bookstand is fin ished you will have an article of furniture of which you may well be proud

A PROBLEM FOR YOUNG DETECTIVES

MR TAYLOR the owner of a factory was about to leave on a business trip on October 1 1945-it was a Monday He was very much surprised to see Jack Smith the night watchman enter his office. He was even more surprised when Jack begged him not to take this trip

Why not? asked Mr Taylor Because last night I had a terrible dream You know, Mr Taylor I always have my one night off on Saturday Well I dreamed that it was Saturday and that I had gone to the movies in the evening to see the last show-I always do that on Saturday I no t ced that an old man with a flowing white beard was sitting next to me Suddenly he turned to me and said Tell Mr Taylor not to take that trip on Monday or he will surely die Then he jumped up and before I could say a word to him he had left the theater I rushed right out after the old man but by the time I reached the street he had d sappeared None of the bystanders had seen a man with a white beard leaving the moving picture theater

I remember that in my dream I was very much worried I begged you not to leave on your trip but you only laughed at me Suddenly I found myself standing by a rail way track A train came speeding by No sooner had it passed me than it left the rails and soon it was a mass of wreckage I ran up to the scene and saw you lying dead by

Please Mr Taylor don't gol I know the tracks that this dream was meant to serve as a warning to you Something terrible will hap

pen to you if you go today

Mr Taylor paid no attention to the warn ing of the night watchman He left on his trip as he had planned There was much any nety among Mr Taylor's employees because the night watchman told everybody about his dream To everybody's relief Mr Taylor returned safely from his trip-and promptly discharged the night watchman

Why? With the clues that we have given you above you should be able to tell We give the answer in upside-down type on page 384



L It is easy to make this attractive agree

ERE is an apron which is very easy to make and yet it pretty and practical, as Figure 1 shows The amount of material to be used will depend upon the size of the graft or whom the apron is intended For secretary, as the same and the approximation of material, 35 inches wide. The apron will look well in a flowered, plain or checked cotton fabric.

STITCHES TO BE USED

(1) Back statch (for seams and for join ing pieces together) Take a small statch Take a second statch back over first one bringing the needle to the right sade of your material, the length of the first statch that was taken

(2) Hand hern (for hems) Fold matrices to with needed for hem, allowing a lattle that the edge of the material may be turned under Press edges of hem with fingermal so as to make a crease, pun the hem down them begin the hand hem Take a single rich begin the hand hem Take a single fold of the hem Winner and past below the fold of the hem Winner and the needle through, push it upward put a before the edge of the hem fold Draw the needle through materials.

HOW TO MAKE AN APRON

TOP PIECE

With a tape measure take the measure from the wastline (or from the belt or sash of the dress) to the base of the neck. Cut out a square piece of cloth, each side of which will have the above dimension Make a ½ inch hem on all four sides, using the hand bem

BOTTOM PIECE

Measure from the waistine down to the bottom of the dress Add 1/2 inches to this Then measure around the waist from one side eam of the dress to the other side eam Cut out a pace of material using these two measurements Make a ½-inch hem on all four sides, as for the top piece

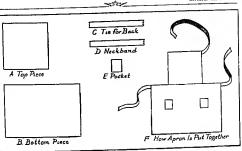
Join the top and bottom pieces together, putting the bottom of the top piece under the top of the bottom piece (See I, Figure 2) Use the back stitch

TIES FOR BACK

Cut out two straps of material 3½ inches mode and long enough to ter into a bow in the back, when jouned to the upper edges of the battom perce Fold each strip own the center of the length so that the strip will be center of the length so that the strip will be the long that the strip will be the long that the strip indeed to the long sade together this sew the caker of the long sade together this sew the clark of the long sade together with the strip made out so that the scans will not strop made out so that the scans will not the other short side, and sittch the edges of one of the material ½ of an inch on the other short side, and sittch the edges regreter. When both straps have heep pre long the material is not them to the bottom part of the protopy join them to the bottom part of the protopy has aboven at 1, 2 four e 1 upon the strap have a shown at 1, 7 four e 1 upon the strap has aboven at 1, 7 four e 1 upon the strap have the sade with a shown at 1, 7 four e 1 upon the sade with the sade

MECKRAND

Passing the tape measure around the neck, measure from the top right edge of the top piece of the apron to the top left edge. Add a mehes to this measurement. Cut a strip of this length 2½ inches wide and prepare this strip as you did the ties for the back. Now you the neckband to the upper left edge of the top piece. Place the neckband under this



2. This drawing shows the various parts of the apron and also how the aprox is put tagether

top piece as far as the hem, and sew it down with the back stitch Sew on part of a snap on the other end of the neckband Sew the other end of the snap on the top right edge of the top piece, setting the snap on the bem POCKETS

Cut out two pieces of material 4 inches by

3 inches Make an inch hem on one side this is to be the top of the pocket Hem un der the other three sides 14 of an inch Then sew the pockets to the bottom part of the apron Place the bottom of each pocket half way down the bottom part of the apron and halfway between the end and middle of the apron Use the back stitch

A RECIPE FOR PINWHEEL COOKIES

OU will need

I cupful butter or I teaspoonful bak ing powder other shortentablespoonfuls ing milk

2 cupful sugar square unsweetegg yolk I ened chocolate 11/2 cupfuls flour

18 teaspoonful salt Cream the shortening that is work it

with a fork until it is light and fluffy It will be easier if the shortening is at room tem perature when you begin Add sugar gradu ally and continue working the fork around until shortening and sugar are well blended Beat egg yolk slightly and add to sugar and shortening Beat mixture well In another bowl sift flour once, measure

add baking powder and salt and sift again

Add this mixture to the first gradually put ting in some milk each time and mixing well after each addition

Divide dough into two equal parts put ting each in a separate bowl Melt the choco late in the top part of a double boiler and add it to the dough in one bowl Mix the dough and chocolate thoroughly

Put both bowls in the icebox for several hours Remove and work each batch of dough into a rectangular sheet 1/8 inch thick Place the plain sheet over the chocolate sheet and roll both up as for a jelly roll Put roll in wax paper and return to icebox for several

hours, or overnight Remove from wax paper and slice the roll making slices 1/8 inch thick Place on greased cookie sheet and bake in a moderately hot oven (375° F) for about ten minutes

[381 T



This damp terration is provided with a glace cover to keep the fror and cricket from escaping Most of the pixet shown here will thrive even when the air in so demp that bends of water form on the gless and the leave

MINIATURE ZOOS AND GARDENS

By Thomas Gordon Lawrence

TOW would you like to have in your own home a tiny jungle or a dwarf-cactus garden a refuge for tree frogs or a laboratory where you can study the lascinating habits of ants? All that you have to do is to con struct an appropriate terrarium (pronounced teh rayr ih um, the plural is terraria) A terratium is an enclosed place where you can keep living things It is much like an aquar rum except that instead of being filled with water it is intended for plants and animals which live on land

Let me tell you about a terramum which a girl once made in a glass tumbler. In this she kept half a dozen coleus plants and orange seedlings alive for two years! Before plant ing the coleus and baby orange trees she put about an inch of brightly colored pebbles in the bottom of the glass and then put a half inch layer of soil and sand on top of the

In order to have a "lawn underneath the plants she placed a little piece of moss

covered wood on the soil. To have some and mal life in the terrarium she captured half it dozen tiny white insects called springtails which were hopping merrily over the wood and she put them in with the plants She set a flat piece of glass over the top of the tumbler and kept it in place by means of Scotch tape She did not water the plants for many months after the first watering had taken place Two years later all of the plants were still

aline The orange trees had grown to the top of the glass (about five inches) The coleus had grown until its stems were bent and twisted, because it had not had enough room in the glass From the sides of the coleur stems delicate white feathery roots grew right out into the moist air, and the moss had grown much larger than it usually does in the woods The original springtails had died of old age but their great great grandchildren still hopped about like little white grass hoppers

Another terrarium which lasted a long time was made by a boy who wanted a borne for a borned toad which his father had brought him from Texas. A horned toad is not really a toad it is a hazard which lives in desert regions. So the boy decided to make the terrarium as much like a Western desert as he could

He was lucky enough to have an old aquarum two feet long and a foot wale trist he cleaned the aquarum very are fully. Then he put a two mich her of peb best and broken precess their and all over the sum of the

"DESERT VEGETATION" THAT A BOY OBTAINED FOR HIS TERRARIUM

Now came the problem of getting the right kind of desert vegetation Fortunately the boy was able to buy some small prickly pear cactus and an aloe He planted these with only a little soil to cover the roots or cut stems He wanted a thicker growth of plants in one part of the terrarium-such a growth as one might see in the brief rainy season in the desert. So he went into the garden and got some weed and flower seeds Some of the small weeds looked quite beautiful when they grew behind glass. The boy did not put any cover over the top of the terrarium as he was not afraid that the borned toad would climb out over the glass side and he knew that it needed a free circulation of air

The terraria that we just described are examples of the two principal kinds—damp and dry The girl had made a damp terrar har the boy a dry one in damp terrar are had so and the size of the dar is kept most A glass cover must be propeded and must be kept in posited and must be kept in posite mostive. A dry terrarium is not really dry, but it bas much less mostive than a damp terrarium bry terraria are sometimes provided with bass covers sometimes they are left incovers.

SOME IMPORTANT RULES TO FOLLOW IN MAKING A DAMP OR DRY TERNARIUM

There are some general rules to follow, whether you are making a damp or dry ter rarium Almost any glass vessel will serveau old drinking glass a glass buttle a glass preserve jar The best thing for the purpose

however is a rectangular aquarium which you can buy in any store that sells tropical fish. In general the thinner and clearer the glass the more beautiful the plants and ani mals will appear

IT IS IMPORTANT TO HAVE GOOD DRAINAGE FOR THE PLANTS IN A TERRARIUM

Always put a layer of pebbles or troken crockery on the bottom This all we surplus water to drain down and insures a suppli of life giving oxygen for the roots of the pile of the pebbles or crock of the pebbles or crock on top of the pebbles or crock on the pebbles or crock on the pebbles of the pebbles o

keep the glass so clean that it sparkles Sometimes your terrarium will become far more attractive it may be a piece of white cloth or white upper behind it. The cloth or paper will may also the present of the paper will be upper beauting the piece of the paper will be upper beauting the piece of the paper will be upper beauting the piece of the paper will be upper beauting the piece of the beauting the piece of the piece of the piece of the whote sand or marble chips to cover part of the soil if the terrarium looks dark or dungy Fragments of red brick will also hrighten up its appearance.

TOO MUCH BEAT MAT PROVE PATAL TO BOTH PLANTS AND ANIMALS

The greatest enemy of life in a terrarum is TOO NICCH HEAT Keep your terrar um away from hot stowes or radiators If you have for hot stowes or radiators If you have for hot seek and the s

toom is only pressuitly wait.

When it gets too hot inside terratum the growth of molds and bacteria is stimuted that the growth of molds and bacteria is stimuted and the plants lose their resistance to fungus infection. Some plant (like most grasses and pune and cetal seedings) can be kept inside a closed terratum only if the temperature inside remain low. Otherwise their green leaves become covered with cobwibby mold almost overmant.

The nert greatest danger to both plants and animals is one of two opposites TOO MUCH WATER and TOO LITTLE WA TER If your terraum is a Goed one (one with a glass cover on top) you may not have to water it again for weeks or even years if you put in the right amount of water at first The amount of water you put in depends on what kind of growth you wish and also on whether you want a damp or dety terraum.

SOME TERRARIUM PLANTS REQUIRE MUCH MORE WATER THAN OTHERS

If you are going to raise cactus or other succulents (plants with fleshy stems or leaves) in a closed testratum you should put in very little haster so that practically no mist over forms on the line de of the plass. For so that a definite mist forms on the glass whenever it is chilfed Still more water should be added it you are making a damp terratum. If you wish to raise delicate mosses and fern in their greatest beauty the interor should be so most that big drops cover thang occasionally from the glass.

If you have an open terratum (one with out a glass cover) you must watch it care fully and water it as soon as necessary. If you have a good foundat on of pebbles you will be able to see the water running down between the stones and three will be no danger of the sol becoming water logged between the stone and perhaps most will grow between the stone of perhaps most will grow between the stone of the sol become the control of the sol become the sol become the sol to good the sol between the sol to good the sol become the sol to good the

The very best plants for a damp terrarum come from the depths of the forest They are the mosses ferns and small woodland flowers. Cut flowers when placed in a damp terrarum will last many days longer than in the open air generally they will be much more beautiful too.

Practically all the plants of your garden and the reughborhood roadside will grow in a dry terrarium. The best plants for this purpose however are the prickly pear eachies and the aloc. When we speak of cactus plants we generally have the prickly pear cactus in mind (The eagle on the flag of Mexero is perched on a prickly pear) A good thing about cactus and other succellents is that when you want a new plant all you have to do is to cut off a part of the old one. You let the cut base of the stem dry for a day of two then you plant it just barely covering the base with soil or sand

The aloe which is a native of Africa and Arabia and is related to the bitter aloes men toned in the Bible is perhaps the best of all plants for dry terrara. It has long smooth fleshy leaves with a row of teeth one each side. The Jeaf pholds so much water that if you cut a leaf and squeeze it drops of water spurt out as if from a foundain Aloes produce numerous small plants growing from the base of the old one so that you soon have a number of new plants in addition to the original one.

Some plants are very adaptable and grow well an either a dry or damp terrarum among these are the colous and the begons Orange lemon and grapefrus teed my will grow beautifully in either dry or damp at their roots Chickwed: the damp, weed make their roots Chickwed: the damp, weed make bested extest and also on fairly day and It grows even better with larger flowers in a terrarum so damp that the leaves of the plant are always beaded with hig drops of water

ANIMALS LIKE PLANTS, VARY IN THEIR ADJUST TO STAND DAMPRESS

In selecting animals and insects for your interaction you must remember that like plants they vary in their ability to stand dampness it is impossible to have the air too most for frogs salamanders earthworms and pill bugs on the other hand snakes transfer and most insects do much better in a rather day aimosphere. For example, or a rather day aimosphere for example for an office of the property of the property

ANSWER TO THE PROBLEM ON PAGE 379

night lint it he had a dream on Sunday singht he must have been asleep at the time That is why Mr Taylor discharged hun he was supposed to be nothing every other one n ght off on Saturday. That meant that the was supposed to be nothing every other

THE MYSTERY OF THE DISAPPEARING EGGS

TERE is a feat of magic that will amaze any audience We ask if someone will be kind enough to lend us a hat-a mans felt hat or any hat with a deep crown We set the hat with the brim upward on the table in front of us Then we pull a handler chief from our pocket and show the audience that it is a perfectly ordinary handkerchief with nothing hidden in it

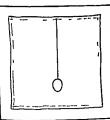
We hold it up hy the two upper corners so that the bottom is just about two inches from the hrim of the hat We gradually draw the two upper corners together and-wonder of wonders-an egg comes out and drops

into the hat

We straighten out the handkerchief then draw the two corners together again and an other egg drops into the hat We continue in this way until the hat contains half a dozen eggs Then we fold up the handkerchief and

but it in our pocket

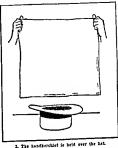
We pick up the hat very carefully bring it over to the person who lent it to us and then suddenly put it on for him When our friend removes his hat the audience expects to see his hair covered with a wonderful mix ture of egg shells egg Jolk and egg white of at all! The eggs have disappeared from the hat and there is no trace of them What has happened?



I. How the egg is attached to the handkerchief

les of course, this is a trick We shall need not a half dozen eggs but just nne-a white one-for our performance It is to be prepared for the trick in the following way First we pierce the shell at opposite ends

with a darning needle. Then we enlarge the hole at one end by picking away at its edges with the point of the needle until the hole



has a diameter of 1/8 inch We place the egg over a saucer and we blow through the smaller hole causing the contents of the egg to come out through the larger hole

We now take a piece of white thread about fifteen inches long knot one end and insert the other in a needle We pass the thread through a piece of white paper about 1/2 inch square We dip the paper in mucilage then fold it so that it will pass through the larger hole When we have passed it through the hole we pull lightly on the thread so that the mucilage-covered paper is brought into contact with the under side of the egg When the mucilage is dry, the thread will be firmly attached to the egg

We sew the other end of the thread to the bem of the handkerchief as shown in Figure I When the egg hangs down as shown it should extend to about three inches from the opposite hem. This is a view of the handker chief that the audience will never have if you can help it because the egg will always hang on the side away from the speciators You should use a very heavy linen handker chief so that nobody will be able to make out the outline of the egg through the cloth A napkin would be even better if small enough to be mistaken for a handkerchief



A Tax two types corress an brench sucritics.

We perform our truck standing behand a table. The members of the audience abouted be at least three feet away from the other ade of the table or else they may be able to detect the truck When we are about to began the performance the napkin and egg are the performance that the properties of the performance that the performance tha

Concealing the egg in the palm of the right hand we now draw out the handker chief Still keeping the egg hidden we hold out the handlerchief as in Figure 3 we con vince the audience that there is nothing hid den in the handlerchief Still holding out the handlerchief with the prepared side away from the audience we let the egg fall into place. We now hold the handlerchief over the hat with the bottom of the handlerchief about two inches from the born (Figure 2).

We bring together the two upper corners of the handketchief as shown in Figure 3. This causes the egg to drop until it is in full xer of the audience under the handket chief We lower the hat until the egg is lying in the bottom of the hat Then we draw apart the two upper corners again and raise the handketchief until it is again in the postion shown in Figure 2. We repeat the per formance a half dozen times By that time (at least that is what the audience will think) there will be art eggs in the hat

Now we bring together the two upper cor ners of the handkerchief so as to conceal the egg in the fold. Then we put the handker the in our pocket. We then complete the performance by picking up the hat and place.

ing it on the owner s head

To present the trick most effectively you should practice it to over and over again Of course you must be careful at all times not to crack your egg Professional magicians generally use a cellibilide egg for tricks of this kind since it is not so fragile Cellibilide egg are inexpensive. You may buy them at mag c shops and in many stores that specialize in novelties

THE GAMF OF DOUBLETS

To play this interesting game we choose the wowned soppose to or quite different in meaning each containing the same number of letters Since they come in pars we call them doublets. Here are some examples of these doublets black—white inght—wrong good—wil beef—pork

The game consists of turning one of these words into the other by changing only one letter at a time thus making a chain of words between the doublets. Following is an example of such a chain

black—white black slack stack stalk stale shale whale while white

You will note that only one letter is changed in each word to make the nest Only words that you can actually find in the dictionary can form part of the word chain Again in changing one letter to make a new word in the chain the substituted letter must occupy exactly the same post on in the word as the letter that we have taken out That is we must not have a chain con taning a sense like 'hole earl, lure

Garden Lover's Calendar

Compiled by Elizabeth Peterson

January 1 15

Most house plants require little water dur ing this month However plants should not be allowed to dry out Plants in small pots will probably dry out quicker than those in large pots Those which are growing rapidly and flowering quickly will dry out most rapidly The best test to determine whether or not the plant needs water is to rap the pot sharply if it gives a ringing sound the plant

Seeds which have been left over from the past season should be tested carefully before they are planted A satisfactory way to test them is to sow a few seeds in small flats label ng each kind carefully and also indi cating the number of seeds of each kind that

have been sown

January 16 31

An occasional sprinkling overhead or dp ping in a tub of water will serve to remove dust from the foliage of ferns grown in the house and will promote their healthy growth Palms should be sponged

Spraying with lime-sulphur (one part lime sulphur to twelve parts water) during warm winter weather is the most effective method of ridding fruit trees and shade trees

of scale pests

The following house plants will grow well in a warm room palms ferns cactus plants and fig plants. They grow best in a tempera ture of 65 to 70 degrees in the daytime and 60 to 65 degrees at night

February 1 15 Begonia plants should be potted in Feb ruary or March Place a dash of sand under each bulb place the pots in a box of wet ashes or sand extending to the rims of the pots and put away in a cool part of the cel



lar When the plants show signs of growth bring them into the light but do not supply them with too much water until they become well rooted

February 16 28 (20)

Twigs of the willow maple elm bickory cherry and crab apple may be brought in doors for winter decoration

Daffodil bulbs that have been forced dur ing the winter should be planted as soon as the frost is out of the ground

Keep window boxes that are filled with evergreens well watered during the winter months Even if ice forms around the plants no harm will be done to them

March I 15

It is best to repot palms and similar house plants at this season so that they will be ready to make their annual growth in the summer Use a pot one size larger Ram the soil around the edges very tightly with a stick—so tightly in fact that the pot will not drop away when the palm is lifted by

its leaves Plant dahla tubers in peat moss and as soon as the sprouts have made several inches of growth cut them off and set them in

sharp sand

March 16-31

As soon as all danger from frost is past remove the dead leaves and stalks from around the perennial plants (plants which continue to live from year to your) Speat new growth with Bordeaux mixture to prevent fungus disease

The seeds of slow growing annuals (plants that live only for one growing season) such as zinnias pot marigolds petunias asters and heliotrope should be started in boxes

of earth or in pots in the house or ele in hotbeds

I rune old rose bushes when the weather is not too cold cutting away all dead wood

1 pril 2 2 c

All early sown plants should be hardened off in the cold frame before they are moved to the open ground Clean the lawn of weeds fill in the holes

with fresh soil and seed over all the bare Percunials should be planted as soon as

they can be handled in workable soil Stake and wire newly planted trees to prevent them from swaying in high winds Water all newly planted trees and shrubs at frequent intervals

[bril 26 30

Do not scrape the bark of trees to destroy injurious insects for great damage may be caused to the cambium laver

Pansies dais es and forgloses that have been carried over the winter in cold frames can be moved into beds or borders now to make room in the frames for the early plant ing of the tender perennials

With the exception of the magnol a which may be moved in May all deciduous trees and shrubs (that is those that lose their foliage every year) should be transplanted as soon as possible

May 1 15

Evergreens can be transplanted latee than deciduous trees but do not neglect to souk them with plenty of water every other day for several weeks after they have been moved

Peonies require plenty of water while the buds are being formed early in May A spray of one pound of blue stone and one pound of lime to fifty gallons of water applied when the buds are the size of buckshot will prevent blight and early applications of bone meal will supply nourishment

May 16 30

Best results in destroying weeds are ob tained by sprinkling a good weed killer over walks and drives and washing it in with the hose It is better to soak the paths or roads with water before applying the weed killer or else to apply it after a heavy rain

Daily sprinklings of the lawn will bring the grass roots to the surface of the soil It is better to give the lawn less frequent but

bears soakings

Bone meal can be used with good effect around perennials including roses The lat ter respond well to applications of liquid manure when they are coming into bloom

June 1 15

June is the ideal month for planting dahl as either tubers or green plants. The clumbs should be senarated leaving a part of the neck with an eye on each tuber and the lubers should be planted six inches deep on their sides

Petunias and forget me nots make good fillers for rose beds because they do not draw

much noureshment from the soil

If peons buds are cut off before they break open and placed with their stems in deep water in a cool cellar they will form better flowers The buds should be suft to the touch when they are cut

June 16 10

Cut off the old flower heads on lilacs and break off those on rhododendrons without removing any of the branches

The following annuals make good potted plants for porch or terrace decorations pe tunias annual larkspur snapdragons helo-

trope and mignonette

I lants with I ce on them should be spraced with a nicotine preparation This should be done as soon as the insects have been noticed on the plants

Spray evergreens with I me sulphur

July 1 15

Then out the old wood of shrubs that have finished blooming Stake tall perennials before they begin to

bend and break Tie them with raffin or keep

them confined in wire hoops Lawns should not be cut as closely now as in the spring Remove clippings as they mat between the grass and hader growth

Sweet peas will continue to flower if no blossoms are allowed to go to seed if they are well watered and if they are heavily mulched to keep the ground cool (A mulch is a covering of straw, leaves or other sub stance spread upon the ground to protect the roots of plants)

July 16 31

The tarnish plant bug that punctures the growing tips of asters in hot weather can be kept in check with a tobacco spray or by dusting with air slaked lime

To rid nasturtiums, sweet peas and golden glow of the pest called the aphis, spray with

a montine preparation

The best way to obtain winter blooming geraniums is to start slips or cuttings in June er early July Grow the plants in pots shift ing them to larger pots as they develop

August 1 15

Crab grass, worst of all lawn pests, will be seeding soon Rake the lawn before mowing to bring up all seed stalks so that they may be cut off Sweep off all lawn clippings where crab grass is present

Hardy fall chrysanthemums will flower best if they are heavily watered and well fed with liquid manure or other fertilizer

August 16 31

plants for next winter

Water all plants during a period of drought until the ground is saturated not less than four inches in depth Never spray them when the temperature drops suddenly or when northeastern winds are blowing for th s causes mildew

Take cuttings of English ivy, poinsettia and beliotrope and pot them up for house

September 1 15 Il lily of the valley plants have become overcrowded the entire bed should be dug up at this time and the larger pips or roots reset two or three inches apart and just un

der the surface Divide and plant peomes this month so that they will become well established be fore the bad frost Select strong divisions with three to five eyes and set them with the topmost eye not more than two inches below the surface

Withhold plant food from the rose garden from now on, but keep the soil well mulched

September 16 30

Chrysanthemums should be staked given liquid manure and sprayed or dusted with a nicotine preparation

Dwarf asters may be taken from the garden and set into small pots for flowering in the house The ground around these plants should be thoroughly watered an hour or two in advance and the pots should be placed in a sunny window

Purchase house plants from the florist as soon as possible so that they will become gradually mured to the dry house air while the windows may still be left partly open to admit fresh air

October 1 15

Tulips daffodils and hyacinths which are to be forced indoors must be buried in a trench outside or kept in a cold fran e or a cool cellar for several weeks until root

growth has been started

-3455

Be sure to plant bulbs right side up Most spring blooming kinds have a pointed top and a kind of ring at the bottom where the roots were attached Lily bulbs have scales pointing toward the top and should be tilted slightly so that water will not lodge in the scales and cause them to rot The bottom of a crocus bulb is slightly depressed

October 16 31

Several of the ferns which grow wild in the woods make very good house plants They should be taken up after the frost bas destroyed the tops but before the ground has been frozen It is best to leave them in a large pot until they freeze solid and to take them indoors early in December

Rock gardens may be constructed at this late date but it is advisable to delay plant-ing until next spring. This will give the rocks and soil a chance to settle so that when the plants are set out there will be no air pock ets to dry their roots Rock gardens recently planted will need careful winter mulching with salt bay evergreen boughs and the like

November 1 15

After the hardy chrysanthemums are through flowering cut them back to within a few inches of the ground If this is done heavy shoots will appear in the spring these will be excellent as cuttings

Bulb plants and perennial borders should not be mulched until the ground is well frozen Otherwise a nesting place for mice will

be provided

This is the ideal time to plant tulips Cover them five inches deep space the bulbs five inches apart Do not locate beds of bulbs under eaves or where water will col lect during the winter months

November 16 30 Cover the bulb beds with a light litter when freezing weather has set in Crocus bulbs should not be too near the top or thes will heave and will be easily dug out by mice

Stagnant surface water from melting snow during winter months is dangerous to per ennials. This condition may be prevented in many cases by digging shallow ditches to

carry off this surface water
Woodbreaks to be set around shododendron beds and exposed evergreens should be put in place before the ground freezes stretched over wooden frames are desirable

December 1-15

Seeds collected from the garden must be kent dry over winter Stout namer bags or envelopes are best I ach of these should be plainly marked and arranged alphabetically in horses

When the ground has became stiffened with frost, give all evergreens especially those transplanted late this fall, a heavy mulch of straw or well rotted manure Heliatrone seed may be sown this month.

it will germinate very slowly

December 16-16

Tubbed has trees, box bushes and hydranreas are best stored in a dark, cool well sentilated cellar that is frost proof Water them only occasionally

Libes, bull-s and rose beds should now receive their winter mulch Cover with neat

moss or buckwheat hulis All earden statuars that is movable should

he stored away Otherwise it should be con eted over with watertight boxes, particularly if it is of soft stone This arricle is printed by permission of Swift and

Company Chicago, Ill sola.

A NATURAL HISTORY QUIZ

- (z) Do fish slerp with their eyes open? (2) Does the kangaroo run when it is frentened?
- (a) "Among the insects that feed on other insects are the dragon fix the glant
- water bug the spider and the wasp What is wrong with this statement?
- (4) Is the mane of the lion lighter or darker than the rest of its body? (5) Is there a bone in the trunk of the
- elephant? (6) Is the horned toad a frog?
- (7) What insect keeps a herd of cows and milks them?
 - (8) What large ammai is dumb? (9) Does a porcupine throw its quilis

- when it is attacked?
- (10) What member of the cat family is trained to hunt like a dog?
- (11) (ould you take a ride on a ses horse? (12) 'The clothes moth ents woolen
- clothing ' What is wrong with this statement? (13) Can you name a large town in antiq
- unty that was set on fire by fireflies? (14) What tree is grown to provide food
- for an insect? (15) When is an artichoke not an arti
 - The answers to the above questions are given upside down on this page

ANSWERS TO NATURAL HISTORY QUIZ

ners racte very much like artichokes pigur 18 a sunnower, but its potato like tu (12) pen it is a feinzalem artichole This is fed on the leaves of the mulberry tree suchy is inside its body, besides, it is a cold to sul tonuck not one thing, the light of the ausment is you process confe not set mus tue semilicas bonuk of the moth (13) The the moth that eats garments, it is the laris spaped the that of a borse (12) it is not yo' the sea horse is a tmy han with a nead (tt) eibni in fem eint ne bonieft et it ant

cuping can not throw them, (10) The chee-The quills come out very easily, but the poron the honey dew (8) The gualle (9) No hand part of the aphid a body The ant feeds stance, called boneydew, oozes from the an aphid with its antennae, a sweet subreep, goors, of aphids Il hen an ant strokes horned toad te a lizard (7) The ant Anta Darker (5) Ao, the elephants trunk is bounds (5) The spider is not an insect (4) closing them (2) No 11 moves by leaps and (1) Jest pecanes spek pare no way of

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Alexander, Sir Hanold R. L. G. (1891.), governor general of Canada During the war he served as Allied Supreme Commander in the Mediterranean theater, where at one time he had a Canadian corps under his command He was the last main to leave Dunkrik when the British and French troops were evacing the control of the property of the control of the contr

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Arnold Henry H (1886) command in general of the United States Army Air Forces During the war he served as a member of the Joint United States Army and Navy Staff and of the Combined Chiefs of Staff of Great Britan and the United States. He entered the newly formed Air Force in 1911, and was studylt to fly by the Wright broth ers. Late in 1945 General Arnold was awarded the Hubbard Medal for our state of the Navigation of the Hubbard Medal for our Halfar, British Ambassador, presented him with the Order of the Bath, one of Great Britani's highest honers.

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muniters of Great Britain and leader of
muniters of great From the beginning
of the Churchil Coultion Government
in 1540 until 13 selects at the polls in
1545, Attlee held a number of important pasts in the Cabinet-Ford Fruy
Seal, Secretary of State for Dominion
Affairs Deputy Prime Minister and
Lord President of the Council On his
election, he pledged that British for
eign policy on international co-opera
tion would not be changed. He was

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educated at Oxford, became interested
in social service work and in politics
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Bach, Johann Sebastian, German composer, 142

Barter, 214 Bartók, Béla (1881 1945), Hungarian composer Outstanding in the field of modern music, he was a leader in the re belien against the more remantic traditions of nineteenth-century music He studied in Budapest and while there wrote his kossuth symphony, celebrating the great Hungarian hero At the same time he became deeply interested in Hungarian folk music, accumulating a tremendous collection, which in time influenced his own work. It led him to the use of new harmonies and the adontion of a twelve-tone scale He chose exile in 1940, and his last five years were spent in the United States

Bascom, Florence (1862-1945), American geologist She was avocated with Bryn Mawr College from 1895 on, returing as professor ementus of geology in 1928. An authority in her field, abe contrabuted to a number of geology periodicals. She studied at the University of gree of 1th 10 from Johns Hephan. Him versity, the first woman ever to receive this honor from that institute this honor from that institute this honor from that institute this honor from that institute.

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Blames, Thomas A (1884-), command
ing general of the land forces of the

United Nations in Australia during the war, under the supreme command of General MacArthur He was present at the formal surrender of Japan aboard the USS Missouri, September 2, 1945, and signed for Australia. Late in 1945 he retired as chief of the Australian General Staff

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of the Okinawa campaign. It was dur ing this action only a few days before the island was completely won that he was killed by a shell as his men drove the Japanese south Earlier in the war he was in command of the defense of Alaska and routed the Japanese from the Aleutian Islands He was born in Munfordville Kentucky and gradu ated from West Point During the Aleu tian campaign he received the Distin

guished Service Medal and rose to the rank of lieutenant general Buddhiem

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338 40 Byas Hugh (1875 1945) foreign corre spondent and an authority on Japan As Tokyo correspondent for the Lon don Times and the New York Times from 1926 to May 1941 he was an evewitness and faithful reporter of such events as the conquest of Manchura and the war in China He was born and educated in Scotland and early became associated with British new-papers. He first went to Japan in 1914 and alto gether spent twenty five years there.

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45) commander of the Third White Russian Army His troops were the

Chernashovsky, Ivan Dandovich (continued) first to set foot across the border of the to set foot across the border of the received the wounds which resulted as property to the set of the set of the has death. He was the youngest general and Army Group commander in the Russian Army, and belped to drive the Nazio out of Wille Russia.

the Nazs out of White Russia.
Chang Kas shek (1886.) presendent of
the Chinese Republic, and of the Kuo
mattang China's cheel political party.
The defeat of Japan left China a very
The defeat of Japan left China a very
minord between Chinage sportument
and the Chinese Communists Toward
the end of 1945 he called for a meeting
of the People's Convolitative Council
an all party group to be held in Janu
any, 1946. It was hoped that this meet
ing sould end Chinas a irrawal strife
and the control of the control of the
Yat sen, who established the Chinese
Republic.

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China, 29 31 Chlorophyl in green plants, 304 oc Churchill, Winston S (1874). prime munister of Great Britain 1940 45 He was one of the most outspoken opponents of appeasing Germany in the critical years before the war and when the Chamberlin Government fell partly as a result of that policy, Churchill was called on to lead his country He warned the people that the cost of vic-tory would be "blood, sweat, toil and tears" but his vigor, courage and in domitable will at last led them to vic tory The elections of the summer of 1045 were a defeat not of the man but rather of his party, the Tories He him self was re-elected to his seat in the House of Commons In order to remain there he refused the Order of the Gar ter, which carries knighthood and mem

bership in the House of Lords with it. Clark, Mark W (1896), head of the United States forces occupying part of Austria He is best known for the thrill ing exploit in which he led a secret mission to get information in North Africa in preparation for the Albed invasion in

Clark, Mark W (continued)
1942, and as commander of the Fifth
Army which fought its way north
through Italy He was born at Madison
Batrack. New York, and graduated
from West Point

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manding general of the First Canadian Copps overses From 1940 to 1943 be was chief of the Canadian General Staff Hamilton, Ontaron, is his bridle place, and during, World War I be to the rank of leutenast rober in the control of th

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Crow Carl (1883 1945), American journal ist and author of a number of well known books on the Orient He first went to China in 1911 as associate city editor of the China Press Shanghar and from 1919 to 1937 he owned an advertising agency there His books were written out of this experience. The first of them to become a best seller was Four Hundred Million Customers pub lished in 1937

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Cunningham Andrew B, Sir (1883) Admiral of the Fleet First Sea Lord and Chief of the \aval Staff since 1943 He was commander in-chief of the Al hed naval forces in the Mediterranean during the North African and Sicilian campaigns Cunningham Alexander and Tedder were the commanders respec tively, of the sea land and air forces under the supreme command of Gen eral Fisenhower Cunningham served through World War I and commanded the British fleet in the Mediterranean

from 1939 until the collapse of Italy Cummigham, John H D C Sir (1885) commander in-chief of the Allied fleet in the Mediterranean In August 1943 he had been placed in command of the British fleet in the Levant and in Oc toher, 1943 he replaced Admiral Sir Andrew B Cunningham (a distant cousin), listed above Sir John entered the Royal Navy at an early age and by 1036 was Assistant Chief of the Naval Air Staff

Curie Marie Skłodowska

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chart 344 Curtin John (1885 1945) Australian states man. At his death he was prime n mis ter He had held this office since 1041. when he also became Unister of Defense Co-ordination in his own cab net This was the first labor government in Australia since 1932 He was born at Creswick Victoria and became a tradeumon journalist From 1917 to 1928 he was ed tor of a labor paper the Worker, and published a long series of pamph lets on social and political problems. See also 61 62

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De Gaulle Charles (1800) French sol dier and statesman When France sur rendered to Germany in June 1940 he refused to accept his country a submis sion From London be ralled and led French soldiers sailors and airmen who escaped as well as the underground groups in France the Free French dent of the new French republic A graduate of Saint Cyr (the French West Point) he served in World War I and afterward strongly advocated a mechanized French army

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Eaker, Ira C (1896-), deputy commander of the Albed air forces and cheel of the Albed air forces and cheel of the Albed air staff in the closing months of the war in Europe and the trank of leutenant general in 100 hours achieved of the Cunted States bomber was cheef of the Cunted States bomber and on operating from Great Britam, and in December of this year was given command of all Albed air forces in the Mediterranean theater.

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Eisenhoer, Drught David (1800-), chim of staff of the United State Ann, He was in supreme command of the Albet masson of Europe from the west and after V-E Day was commanding general of the Albet and Carlon State Sta

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Graud, Henra Honore (1879) French army officer In 1042 he was the com manding general of the French armed forces in North Africa co operating with the Allies He had been taken prisoner by the Germans in 1940 but

escaped Girl Guides 152

Girl Scouts 153 Glasgow, Ellen (1874-1945) American nov elist She was born and lived in Rich mond, Virginia and her stories have a realistic Southern setting. She rebelled against the over romantic tradition in Southern writing, and presented her characters more as people who might live anywhere Among her finest novels are Barren Ground The Romantic Comedians and Vein of Iron In This Our Life won a Pulitzer Prize and was

made into a motion picture Glass, for house construction, 264

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Hess, Rudolph (1896-), Nazi party leader who, until May, 1941, was considered Hitler's successor At that time he flew from Germany to Scotland on a mys terious mission.

terious mission, and was interined in England for the rest of the war At the end of 1945 he was being tried before the international tribunal in Nurem

Hibernation, of animals, 303

Hirohito (1901 -), emperor of Japan For centuries whoever held this position was considered god by the Japanese people as the long line of rulers were supposed to be descendants of the Sun Goddess Hirohim (continued)

This religious aspect of the throne was carefully cultivated by the governing class to keep the Japanese people in subjection. Late in 1945, however, Hirobito announced that his people were no longer to consider him a sacred

personage

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in World War I, and organized the Nazi party in the early 1920's On May I; 1945, just before the German collapse he was reported dead, but the report has not been proved See also 119 (key, ic. 200

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Johnson, Hiram Warren (1866 1945), American political leader, born in Sacrameno, Califorma He served as Republican secantor from that state from 1916 until his death. He upposed the League of Nations and favored isolationism and was co-author of the Swing Johnson Act which made possible Boulder Dam

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1946) During the first months of

Jovce, Wisham (continued) World War II, he broadcast from Ger

world war 11, he broadcast from Ger many to Great Britain trying to con vince his audience that German aims were reasonable and that it was stupid to oppose them Captured soon after VE Day, he was tried in England for treason, and paid the penalty with his

hie on January 5 1946 Judge, court officer, 188 Jupiter, planet, 38

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Kern, Jerome (1885 1945), American composer. He wrote hiting tuneful scores for a long list of musical plays that have become part of theatrical history among them Sally, Roberta and Show boat His most famous song Ol. Van

River, was in Showboat

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kng Ernest Joseph (1878). Commander
m chief of the United States Fleet from
December, 1941, to December 1945.
Fleet Admiral king was senior member
of the Army and Navy Jonit Board of
Strategy and a member of the Com
bined Chels of Staff of the United
States and Great Britain. A submarine
expert and an austion, 1987 and 10 Agen
expert and an austromy and the commaintes On his retirement in December,
1945 he was presented with the Navy
Gold Star in lieu of a third Distinguished Service Medal for his 'fore

guished Service Medal for his fore sight' as Chief of Naval Operations kok saghyz (Russian dandelion), 248 korea, 29, 180-81

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Lang Cosmo Gordon Lord (1864 1945)
English churchman He was Archbishop
of York from 1900 to 1905 and Arch
hishop of Canterbury and Primate of
All England from 1918 to 1942. He
was outspoken in the cause of justice
and worked to bring about a greater
unity among the various Christian
churches.

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MacArthur, Douglas (1880), command ing general of the United States forces occupying Japan and under Allied au thorsty in charge of the reconstruction of the Japanese government industry and so on Under him Japan is being disarmed and various political reforms have been instituted. In command in the Philippines in December, 1941 be was ordered to leave by President Roosevelt in March, 1042 Thereafter he halted the Japanese attempt to in vade Australia and became supremo commander of all the Allied forces in the southwest Pacific He served in the first World War, and spent many years in the Philippines He has the five star rank of General of the Army See

atto 28

(CCam John Stdreg (1884 1915) American naval officer who was in command of the famous Carrer Task Force of the Third Fleet He helped to prepare the way for the Peleliu action gas ear cover for the invasion of Lepte and helped to win the second Battle of the Phihppine Sea An Annapolis graduate he served in World War I and in December, 1941, was in charge of the Vaval Air Station at San Diego

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McCormack. John (1884 1945) Insh tenor Born in County Athlone Ireland of Born in County Athlone Ireland of Born in County Athlone Ireland in in opera and a sanger of ballids. He first came to the United States in 1900 and became a cluzen in 1919 But the last years of its life were spent near Dublin.

McNab Archibald (1864 1945) Canadian political leader Born in Glengarry On tarso he went to the West to farm at the age of 18 settling first in Manifolia and then in Saskatchewan He served the latter province as heutenant governor for o years

McNaughton Andrew G (1887) Ca nadaa army officer Lunil Itie in 1943 was in these forced him o reture he was in these forced him of the Canadan Army outereas, with headqurrers in Da and later became director of military training and deputy chief of the Canadan General Staff Uagnesium cr. Mail Universal Postal Union 94 Malaya rubber 245 247 251 253 Manchuria 30 Manihot tree 247 Manufactures see Industry Marshall George Catlett (1880) Amera can army officer From September 1939 until Vovember 1945 he was general of the United States Army On his retirement President Truman appointed Marshall his special envoy to China with the rank of ambassador During the war he was responsible for the development of military plans and for carrying out strategic plans in conjunction with the Naval Staff and Al Led Staffs

Vlascagni Pietro (1864 1945) Italian com poser His best known work is the opera Cavalleria Rusticana which brought him fame overnight in 1890. He wrote a number of other but less successful operas and was very popular in Italy

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Montgomery Sir Bernard (1887) com manding general of the British forces

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Montgomery Sir Bernard (continued) occupying Germany He led the famous British Eighth Army which in 1943 drove the German forces under Rom mel from El Alamein in Egypt to Tunis and hore the brunt of the Punisian and

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Mounthatten Louis Lord (1900-) Brit isb admiral and supreme Allted com mander in southeast Asia from August 1943 in charge of land sea and air forces In December 1945 he held a conference in Singapore on the prob-lems of the Netherlands Indes and French Indo China where the natives are demanding greater rights if not out right independence. He entered the Royal Navy in 1913 and made a bril hant record in World War II In 1942 he was chief of Combined Operations (the Commandos)

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musical events 210-12 Mussolini Benito (1883 1945), Italian dic tator He organized the Fascist party in 1010 and in 1022 won complete power in Italy In June 1040 when it seemed that H tler could not be stopped Mussolun brought Italy into the war on Germany s side Two years later he was forced to resign as premier even as the Allies were beginning the invasion of Italy When the Nazis were finally pushed out of northern Italy Italian Partisans (anti Fascists) executed him and his companions See also 119

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Nimita, Chester Willium (1885) Chiel
of Naval Operations the highest runk
ing admiral in the Navy. He was promoted to this rank in December 1945
For the four previous yetts he was commander in 46 of the United States
Pacific Fleet, with headquarters in Ha-

wan, and thus had direction of all naval action against the Japanese Nobel Prizes, 229 science awards in 20th century 273

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at the San Francisco Conference in Witch, In May, women voted for the first time in Panama's history, Linequi-Value of Panama's history, Linequident of Panama, June 15, Florencio H Arosemen's former president of Pan ama died August 30, the United States Navy, completed the great fuel pipe line acroes the Isthmus of Panama on Sep-

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Fatch Alexander M., Jr. (1889 1945), conmanding general of the U.S. Army forces that won Guadicanal He led the Seventh Army to victory in Europe Son of a general he was born at Fort Huschuca Viziona and graduated from West Fouth During World War I be

san service in France
Fatton George Smith, Jr (1885 1945),
American general in command of the
Third Army, which spearheaded the
great drive across western Europe in
the last year of World War I! He had
wen vectories previously in North A!
rica and Steily. He was an audonous
forceful leader with a washbuckling.

colorful personality Death came as the

result of an automobile accident, and be was burred in the Third Army cenetery at Hamm, Livemburg Pearkes, George R (1858), Canadian army officer who was in command of Canadas Pacific Coast Defense He acted to commence

Canadas Pacific Coast Defense He acted in conjunction with the United States forces in the recapture of the Aleutian Islands from the Japanee late in 1943 in France with the Canadian Expeditionary Force in World War I he won the Victoria Cross For a time he was a member of the Canadian he

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Pétain Henri Philippe (1856) head of the Vichy Government which collaborated with the Germans in the occupation of France On August 15 1945 a Paris jury found him guilty of intelli gence with the enemy and returned a verdict of death General de Gaulle commuted the death sentence to life imprisonment Petain achieved fame in World War I particularly in the siege of Verdun and had a long career in the French Army See also 123 24

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American war correspondent He be came a beloved f gure for his simple homely accounts of the men in the for holes of World War II where he I ved with them He was born near Dana Indiana and was a newspaper man all he life He was killed by a Japanese fullet on le Sh ma a tiny island off Okinawa

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Radium 235 239-41 Raeder, Linch (18 6-) German mival officer who was in command of the German Navy and later War Fleet 13 mital Inspector When the Nat 1 came to power he puned them and worked hald to rebuil German raval power for which il tier rewarded him with the hab command At the end of 1945 be

Raeder Erich (continued) was on trial before the international tribunal in Nuremberg Rafferty Jim 288 Railroads

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ın Canada 83 Ramsay Bertram Home Sir (1883 1945) British admiral who served as naval deputy of General Eisenhower It was Admiral Ramsay's ships which saved the British Army at Dunkirl. and four years later he directed naval operations in the Allied invasion of Normandy He was knighted for his services at Dunkirk His brill ant career in the Royal Navy began in 1808-and ended as the result of a fatal plane crash

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Riddell William Renwick (1852 1945) Canad an jurist From 1920 until his death he was semor justice of the Court of Appeal Ontario During the early part of his career he was a professor of mathematics but he was called to the

bar by the Lawyers Society of Upper Canada w th gold medal in 1883 Rochdale principles of co-operative move

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Roosevelt Franklin Delan (1882 1045) 32nd president of the United States 1933 45 These were dramatic years in the world's history covering the de pression and World War II and Roosevelt became one of the world's lead ng statesmen He was born at Hyde Fark New York and educated at Groton and Harvard and first entered politics in Rossevelt Franklin Delano (continued) roto in spite of the crippling results of an attack of infantile paralysis in 1021 he later was elected governor of New York twice and president of his country four times See also 120 and The Book of Knowledge Annual 1945

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Salten Felix (1870 1945) Austrian writer creator of Bambi the lovely story for children which was later made into a Disney motion picture He was forced to flee when Hitler invaded Austria and spent his last years in Switzerland Other works for children are Perri The Hound of Florence and Herr Wenzel

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Shaposhnikov, Boris Mikhailovich (1832 1945), Russian marshal He was chief of the Supreme Soviet Military Acad emy, and rerved as chief of the general staff during the first year of the German invasion of Russia. Ill health forced him

to retire in the fall of 1942 Sharks, prevention of attacks from, 255 Shaw, Artie, 212 Shaw, Ruth Faison, 369

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Smith Idam, 107-08 Smider, John Wesley (1896-), director of the Office of War Mobilization and Reconversion This is one of the most important positions in the Truman Ad ministration as the office has the tremendous job of turning industrial ef forts into peacetime channels. He is not a newcomer to government, but has served with the Defense I lant Corpora tion and the Reconstruction l'inance Corporation His home is in St Louis Social agencies

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Speatz Carl (1801 1 American army officer who was in command of the United States Atmy Air Forces in the Mediterranean area under hir Marshal Tedder In 1944 Spaatz was appointed commander in chief of the United States bombing forces against Germany In December, 1945 he was presented with the 1945 Robert J Collier avia tion trophy annual award of the \a tional Aeronautic Association for dem onstrating the air power concept in the war in Europe

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Stark Harold Raynsford (1880) Ameri can admiral who commanded the United States naval forces in Lurope His most important duty was to main tain close co-operation between the British and American naval depart ments Previously he had held the im portant post of Chief of Naval Opera tions He has had a long career in the Navy and during World War I was a member of Admiral Sims's staff Ad miral Stark retired in July, 1945 Stars, 35 38

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Stettinus, Edward Reilly, Jr (1900-), United States representative with rank of ambassador, to Security Council and principal representative to the United ations Organization General Assem bis, which was to meet in London in January, 1946 I rom November, 1944 to June 1945 he served as Secretary of State, and in the spring of 1945 was temporary head of the San Francisco Conference He entered government service in 1940, from the post of chair man of the board of the United States

Stilnell Joseph II (1883-), American arms officer From 1042 until the end of 1914 he was commanding general of the United States forces in China Burma and India and a member of the stall of Chiang Kni shek. He had served in China previously and learned the Chinese language. In 1945 he was made

Steel Corry ration

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Stilwell, Joseph W (continued)
chief of the Army Ground Forces and
m November was named president of
an Army board to study equipment

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Szold Henrietta (1860 1945) American
Jewish women's leader founder of
Hadassah the wo nen's Zionist organi
zation in the United States She served
as editor of a number of Jewish publi
cations and was an outstanding leader
in the work for Palestine where she

lived during her last years

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Timoshenko Semyon (1895), commanding general with the rank of marshal of the general defense of Stalingrad and the campaigns that crushed the German Army and recaptured Rostov He is one

Timoshenko Semyon (continued)
of the leading Russian strategists As a

youth he was active in the Russian Revolution Earlier in World War II he directed the strategy in the Polish and Finnish campaigns and in 1941 held the Germans at Smolens, until preparations for the defense of Moscow were completed.

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Trials court 184 85

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d sappearing eggs 385 86

Truman Harry S (1882) president of the Unsteel States In 1944 he was elected vec-president and became president in April 1943 years elected vec-president and became president in April 1943 yearestown, Franklin Roosevelt Truman served as a Senator from his home state of Missive president. He became wordly known for the excellent results he achieved as chairman of the Senate Was Jormed to help pit the production of war materials on a sound bases. Though cause of defective cystight he mer theless served in France dumin World.

major From tozá to 1934 he was pre siding judge of Jackson County 31 s souri Court administration 322 20 Trusteess p Council of United Nations Or

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air lines, 66 68

V E Day, 330-31 V-J Day 25, 330 Van Acker, Achille, 125 Van Anda, Carr V (1864 1945), American journalist He was most widely known as managing editor of the New York Times, a post he held for twenty one years from 1004 to 1025 A master in the gathering and presentation of news. he stood in the front rank of the working newspaper men of his time His special field was news of science, aviation and exploration

Van de Graaff generator, 260 Vandegrift, Alexander Archer (1887) commander, with the rank of heutenant general, of the Umited States Marine Corps, which post he has held since 1943 He led the Marines who attacked and held Guadalcanal against pow-

erful enemy forces in 1942 At Bougainville, in 1943, he commanded the First Marine Amphibious Corps He was born in Virginia, joined the Marines at an early age, and has seen service in

Haiti, Nicaragua, Mexico, Cuba and

China

Vargas, Getulio 275 Venezuela, 277 Versaulies, Treaty of 147 Veto, right of, in United Nations Organiza tion, 319

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Volume, measure, 180 90 192 197 Voronov Nikolai, marshal of the Russian

Atmy and chief of artillery With Mar shal Zhukov he supervised the offensive to relieve Stalingrad and had a prom ment part in the offensive which freed Rostov in the fall of 1042 The Russian Army is powerfully equipped with ar tiflery, which is one of their most im portant arms

Voroshilov, klements (1881-), first mar shal of the Union of Soviet Socialist Republics, who commanded the Lenin grad sector, which underwent a long stege He is a member of the Council of Commissars and for a time was chair man of the Defense Committee One of the original supporters of Lenin and Stalin, he has held a number of im portant political and military posts

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American army officer who commanded the American forces at Bataan and Cor regidor in the Philippines, and was forced to surrender after all munitions and supplies had been exhausted For three years, until the defeat of Japan he was held prisoner, suffering severe bardships On his return to the United States he was made a full general and given the Congressional Medal of Honor for intrepid and determined leadership ' He is the son and grandson of army officers, and had a notable career in World War I and in the

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Werfel Franz (1890 1943) writer born in Prague now the capital of Czechoslovakia. He was most famous as the au thor of the novels The Song of Berna

dette (made into a motion picture) and The Forty Days of Musa Dagh Flee ing the Nazis he came to the Lnited States in 1940 and died in Hollywood West Ind es School er Pool 85 86 Western Air L nes 68 Westerhalia Treaty of (1648) 141

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Vamashita Tamoviki commander of the Japanese armies that captured the then conquered the I hilippines. He was a violent pro German and acquired a notorious reputation for brutality. In toas he was brought to trial for condoning atrocities by his troops in the I hairpoines and sentenced to be hanged His appeal to the Supreme Court to void the Manila trial and transfer case from the War Department to a United States court was still pend ing at the year's close but there was little likelihood that he would escape execution

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Veremenko Andrei chief of the Russian forces that outflanked the Germans at Stal nerad and captured or destroyed twents two German divisions A prize prisoner was the German commander Marshal von Paulus Veremenko has a cold and butter hatred of the Nazis who killed he wife and young son early in the war

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7.

7hukov Ceorgy (1894) commanding general with the rank of marshal of the Russian forces occupying Germany He participated in the formal surrender of Germany and signed for Russia During the war he was in command of the Moscow area and served as first vice-commissar for defense and as sec ond to command under Stalin He en tered the Russ on Army as a private and rose rapidly. He first became widely known for his defeat of the Japanese in the undeclared war in Mongol a in tais to

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